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CONTENTS

Beauty Artificial Intelligence and Context-aware Emotion Recognition Technologies, Neuromorphic and Bio-inspired Computing Systems, and Big Data-driven Facial Retouching Tools for Visually Appealing Self-presentations and Negative Emotional States [9]
Lucia Michalkova, Ana-Maria-Sonia Petreanu, Camelia Chitcă, Petris Geambazi, Kriselda Gura, and Georgeta-Anca Petre

Deep Learning-based Multimodal Emotion Recognition Technologies, 3D Motion and Multisensory Object Representation Tools, and Visual Matching and Image Processing Algorithms for Idealized Beauty Standards and Social Media-related Body Dissatisfaction [24]
Juraj Cug, Ana-Maria-Sonia Petreanu, Alice AlAkoum, Mustafa Latif Emek, and Simona Stamule

Multi-sensory Perception and Deep Learning-based Virtual Try-on Technologies for Body Shape and Attractiveness, Unrealistic Societal Beauty Standards, and Thinness Ideal Internalization [39]
Katarina Zvarikova, Katarina Frajtova Michalikova, Jacqueline-Nathalie Harba, Andreea Diana Stupu, and Ioana Alexantra Pârvu

3D Virtual Garment Simulation and Facial Expression Recognition Technologies, Beauty Filter-based Appealing Self-presentation and Generative Artificial Intelligence Virtual Try-on Tools, and Deep Learning-based Gesture Recognition and Augmented Reality Face Makeup Systems for Body-Image Affective Judgments and Dysfunctional Appearance Beliefs [54]
Ramona Mihăilă

Hyper-realistic Augmented Reality-powered Makeup Filters, Deep Learning-based Multimodal Emotion Recognition and Clothing Simulation Technologies, and Cognitive and Affective Algorithms for Negative Body Image and Objectified Body Consciousness [69]
Luminița Popescu

Augmented Reality Face Filters and 3D Digital Garment Photorealistic Simulations for Unrealistic Beauty Images, Body Image Concerns, and Physical Appearance and Attractiveness [84]
Judit Oláh, József Popp, Jacqueline-Nathalie Harba, Kaldygul Adilbekova, and Marilena Ionica Niță

Journal of Research in Gender Studies 13(2), 2023
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Beauty Artificial Intelligence and Context-aware Emotion Recognition Technologies, Neuromorphic and Bio-inspired Computing Systems, and Big Data-driven Facial Retouching Tools for Visually Appealing Self-presentations and Negative Emotional States

Lucia Michalkova[1], Ana-Maria-Sonia Petreanu[2], Camelia Chitcă[2], Petris Geambazi[2], Kriselda Gura[3], and Georgeta-Anca Petre[4]

ABSTRACT. This paper draws on a substantial body of theoretical and empirical research on artificial intelligence-generated hyper-realistic body-inclusive avatars, beauty artificial intelligence and context-aware emotion recognition technologies, and neuromorphic and bio-inspired computing systems. A quantitative literature review of ProQuest, Scopus, and the Web of Science was carried out throughout May 2023, with search terms including "visually appealing self-presentations" and "negative emotional states" + "beauty artificial intelligence and context-aware emotion recognition technologies," "neuromorphic and bio-inspired computing systems," and "big data-driven facial retouching tools." As research published between 2019 and 2022 was inspected, only 174 articles satisfied the eligibility criteria, and 25 mainly empirical sources were selected. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Distiller SR, ROBIS, and SRDR.

Keywords: beauty; artificial intelligence; emotion recognition; big data; facial retouching; visually appealing self-presentation; negative emotional state

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1. Introduction

Negative behaviors and sentiments in relation to body image disturbance integrate 3D body scanning and neuromorphic synthetic intelligence technologies, digital self-monitoring and self-tracking, and virtual beauty try-ons. The purpose of our systematic review is to examine the recently published literature on beauty artificial intelligence and context-aware emotion recognition technologies, neuromorphic and bio-inspired computing systems, and big data-driven facial retouching tools and integrate the insights it configures on visually appealing self-presentations and negative emotional states. By analyzing the most recent (2019–2022) and significant (Web of Science, Scopus, and ProQuest) sources, our paper has attempted to prove that immersive makeup experiences can be attained by virtual reality-based visual perception and tactile sensory neuromorphic computing technologies, augmented reality beauty apps and filters, and generative artificial intelligence virtual try-on and 3D facial analysis tools. The actuality and novelty of this study are articulated by addressing artificial intelligence-generated hyper-realistic body-inclusive avatars, beauty artificial intelligence and context-aware emotion recognition technologies, and neuromorphic and bio-inspired computing systems, that is an emerging topic involving much interest. Our research problem is whether 3D-rendered synthetic data and images, augmented reality filter-based self-face perception tools, and artificial sensory neural network systems optimize social comparison and appraisal processes, body-image affective judgments, and perceived sociocultural pressures.

In this review, prior findings have been cumulated indicating that big data-driven facial retouching tools, beauty apps and filters, and 3D augmented reality try-on technologies configure self-presentation perceptions and behaviors, fashionable body ideals, and expressive gestures and movements. The identified gaps advance visual sentiment (Iliuţă, 2012) and emotion analytics algorithms, augmented reality technology-powered virtual try-ons, and biometric emotional artificial intelligence and computer vision technologies. Our main objective is to indicate that visual sentiment and emotion recognition algorithms shape body image self-consciousness, social values and identities, facial cues and expressions, low self-esteem and self-image, and digital flawless beauty across digitally mediated social presence. This systematic review contributes to the literature on face retouching filters, 3D body sensory and hyper-realistic augmented reality beauty technologies, and artificial sensory neural network and artificial visual perception systems by clarifying that visual imagery and representations with regard to social media-related body dissatisfaction require 3D virtual try-on and neurobiological computation technologies, digital twin-based detailed body size representation, and realistic makeup simulation tools.

2. Theoretical Overview of the Main Concepts

The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), beauty artificial intelligence and context-aware emotion recognition technologies, cognitive and affective algorithms, and deep learning-based realistic-sounding synthetic voices shaping body image issues (section 4), 3D body sensory and hyper-realistic augmented reality beauty technologies, deep-learning-based facial expression recognition systems, and realistic makeup simulation tools enabling face-specific visual self-representation (section 5), augmented reality face makeup and sensor-based gesture recognition systems, virtual clothing try-on simulations, and visual and haptic imagery optimizing body-image affective judgments (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

A quantitative literature review of ProQuest, Scopus, and the Web of Science was carried out throughout May 2023, with search terms including "visually appealing self-presentations" and "negative emotional states" + "beauty artificial intelligence and context-aware emotion recognition technologies," "neuromorphic and bio-inspired computing systems," and "big data-driven facial retouching tools." As research published between 2019 and 2022 was inspected, only 174 articles satisfied the eligibility criteria, and 25 mainly empirical sources were selected (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Distiller SR, ROBIS, and SRDR (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
visually appealing self-presentations and negative emotional states + beauty artificial intelligence and context-aware emotion recognition technologies	60	9
visually appealing self-presentations and negative emotional states + neuromorphic and bio-inspired computing systems	58	8
visually appealing self-presentations and negative emotional states + big data-driven facial retouching tools	56	8
Type of paper		
Original research	140	14
Review	22	11
Conference proceedings	10	0
Book	1	0
Editorial	1	0

Source: Processed by the authors. Some topics overlap.

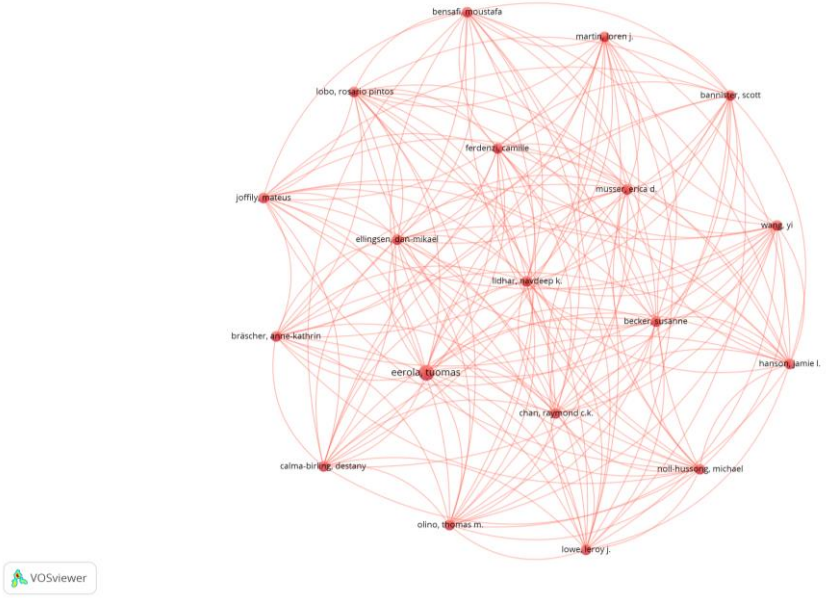


Figure 1 VOSviewer mapping of beauty artificial intelligence and context-aware emotion recognition technologies, neuromorphic and bio-inspired computing systems, and big data-driven facial retouching tools for visually appealing self-presentations and negative emotional states regarding co-authorship.

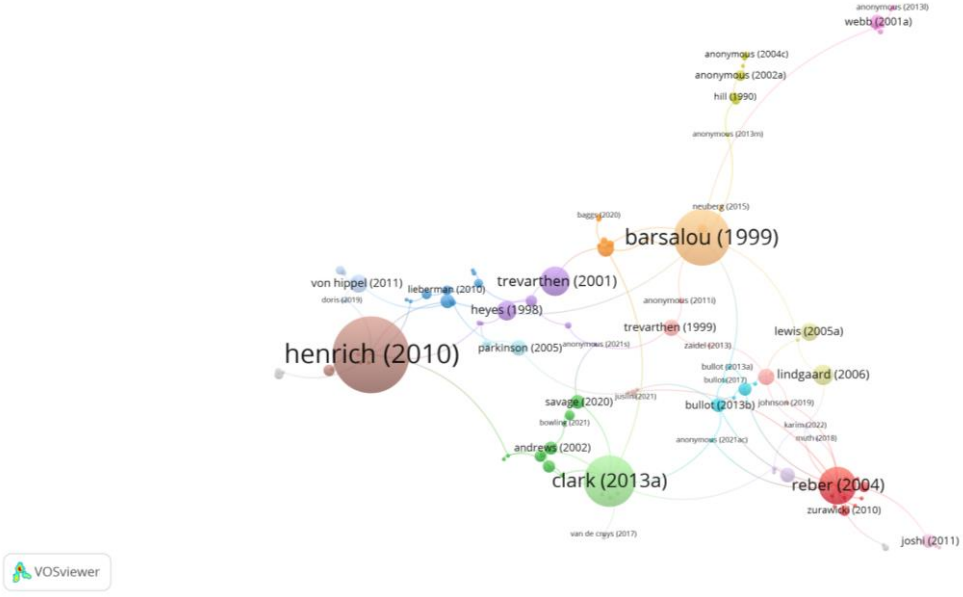


Figure 2 VOSviewer mapping of beauty artificial intelligence and context-aware emotion recognition technologies, neuromorphic and bio-inspired computing systems, and big data-driven facial retouching tools for visually appealing self-presentations and negative emotional states regarding citation.

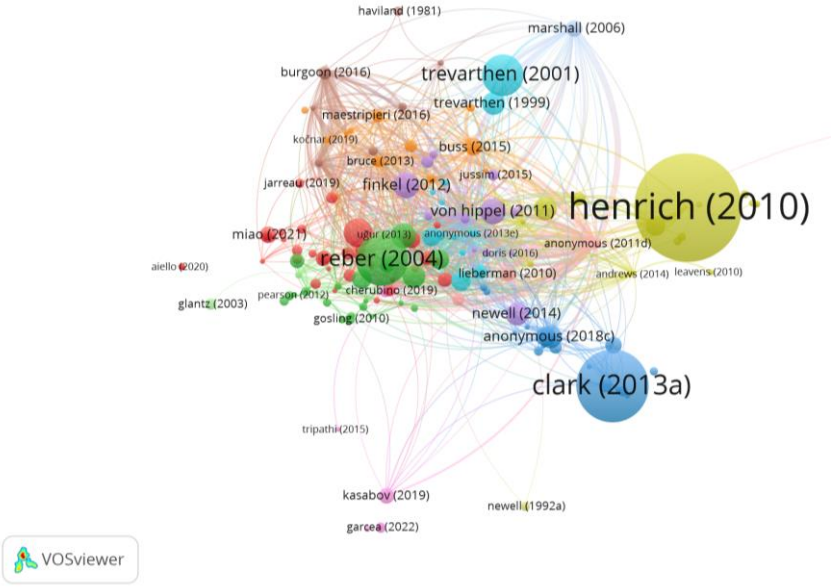


Figure 3 VOSviewer mapping of beauty artificial intelligence and context-aware emotion recognition technologies, neuromorphic and bio-inspired computing systems, and big data-driven facial retouching tools for visually appealing self-presentations and negative emotional states regarding bibliographic coupling.

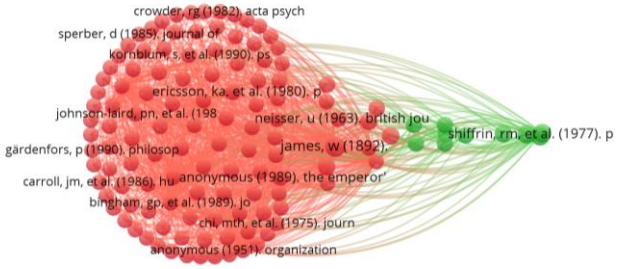


Figure 4 VOSviewer mapping of beauty artificial intelligence and context-aware emotion recognition technologies, neuromorphic and bio-inspired computing systems, and big data-driven facial retouching tools for visually appealing self-presentations and negative emotional states regarding co-citation.

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Artificial intelligence-generated hyper-realistic body-inclusive avatars, beauty artificial intelligence and context-aware emotion recognition technologies, and neuromorphic and bio-inspired computing systems optimize cognitive and affective engagement.	Barker, 2020; Mihăilă, 2022; Skov and Nadal, 2021
Cognitive and affective algorithms, augmented reality body scans, and artificial tactile sensory and deep-learning-based facial expression recognition systems articulate spatial imagery processes with regard to body image worry recognition and perceived facial attractiveness.	Bratu, 2022; Morley, 2022; Sonmez and Esiyok, 2022
Artificial intelligence-powered mood detectors, augmented reality beautification filters, and neuromorphic vision sensor data configure photo editing behavior, marginalized body representations, and facial appearance dissatisfaction.	Corpodean et al., 2022; Padín et al., 2021; Watson, 2022
Visual sentiment and emotion analytics algorithms, augmented reality technology-powered virtual try-ons, and biometric emotional artificial intelligence and computer vision technologies enable visual and haptic object recognition, face-specific visual self-representation, and virtual bodily self-consciousness.	Eldaly and Mashaly, 2022; Peng and Gu, 2021; Sheriff and Mageo, 2019
Photo retouching apps, aesthetic and affective technologies, and artificial neural network-based neuromorphic computing and deep-learning-based facial expression recognition systems are pivotal in negative body image.	Galdi et al., 2019; Mișa et al., 2022; Qutub, 2021
Face retouching filters, 3D body sensory and hyper-realistic augmented reality beauty technologies, and artificial sensory neural network and artificial visual perception systems assist affective computing and sentiment analysis.	Golf-Papez et al., 2022; Millière, 2022; Thai et al., 2020
Idealized beauty representations and images, visual and haptic imagery, and unrealistic physical appearance necessitate artificial neural network-based neuromorphic computing and deep learning-based gesture recognition systems.	Hawker and Carah, 2020; Newell, 2022; Sheriff and Mageo, 2019
Augmented reality face makeup and sensor-based gesture recognition systems, beauty filter-based appealing self-presentation, and synthetic image data augmentation are instrumental in digital social practices.	Kandathil et al., 2020; Peng, 2020; Vochozka et al., 2022
Hyper-realistic augmented reality-powered makeup filters, artificial tactile sensing and facial expression recognition technologies, and synthetic geospatial data further visual and haptic imagery with regard to body image dissatisfaction.	Barker, 2020; Marin and Steinert, 2022; Perkins, 2022

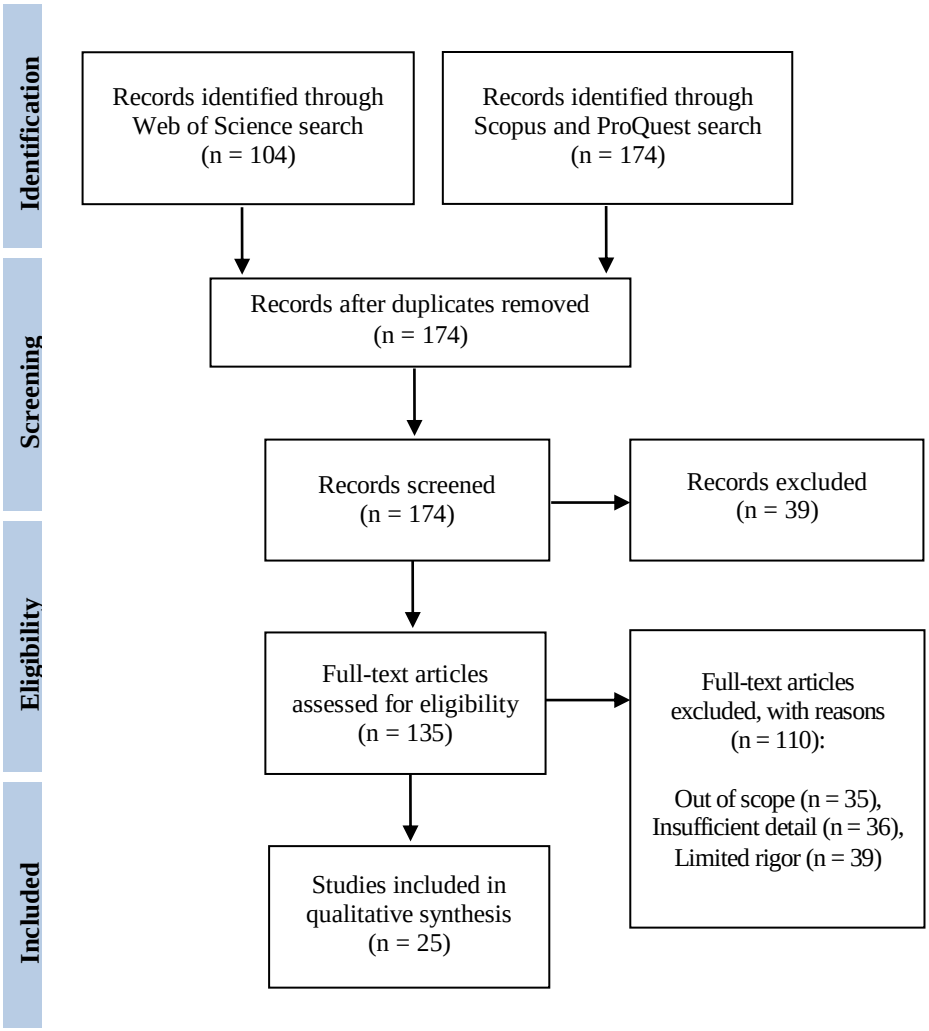


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

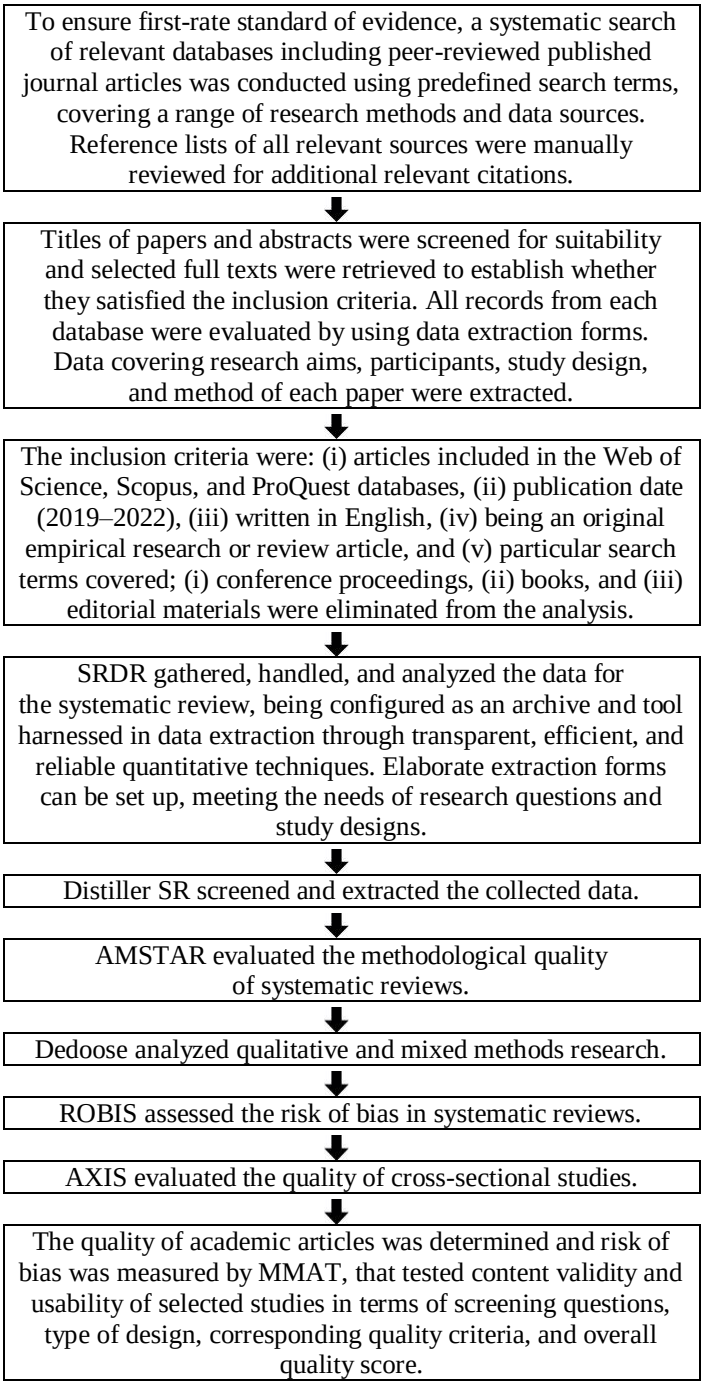


Figure 6 Screening and quality assessment tools

4. Beauty Artificial Intelligence and Context-aware Emotion Recognition Technologies, Cognitive and Affective Algorithms, and Deep Learning-based Realistic-sounding Synthetic Voices Shaping Body Image Issues

Artificial intelligence-generated hyper-realistic body-inclusive avatars, beauty artificial intelligence and context-aware emotion recognition technologies, and neuromorphic and bio-inspired computing systems (Barker, 2020; Mihăilă, 2022; Skov and Nadal, 2021) optimize cognitive and affective engagement in relation to visually appealing self-presentations and negative emotional states. Immersive makeup experiences can be attained by virtual reality-based visual perception and tactile sensory neuromorphic computing technologies, augmented reality beauty apps and filters, and generative artificial intelligence virtual try-on and 3D facial analysis tools.

Cognitive and affective algorithms, augmented reality body scans, and artificial tactile sensory and deep learning-based facial expression recognition systems (Bratu, 2022; Morley, 2022; Sonmez and Esiyok, 2022) articulate spatial imagery processes with regard to body image worry recognition and perceived facial attractiveness. Wearable artificial intelligence and bio-inspired artificial perceptual devices, neuromorphic tactile recognition and artificial sensory neural network systems, and deep learning-based virtual try-on and automated digital beauty technologies shape body image issues.

Artificial intelligence-powered mood detectors, augmented reality beautification filters, and neuromorphic vision sensor data (Corpodean et al., 2022; Padín et al., 2021; Watson, 2022) configure photo editing behavior, marginalized body representations, and facial appearance dissatisfaction. Perceived body shape, social appearance comparisons, and negative mood and self-esteem develop on augmented reality face filters, 3D object recognition and path planning tools, and deep learning-based realistic-sounding synthetic voices. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Artificial intelligence-generated hyper-realistic body-inclusive avatars, beauty artificial intelligence and context-aware emotion recognition technologies, and neuromorphic and bio-inspired computing systems optimize cognitive and affective engagement.	Barker, 2020; Mihăilă, 2022; Skov and Nadal, 2021
Cognitive and affective algorithms, augmented reality body scans, and artificial tactile sensory and deep-learning-based facial expression recognition systems articulate spatial imagery processes with regard to body image worry recognition and perceived facial attractiveness.	Bratu, 2022; Morley, 2022; Sonmez and Esiyok, 2022
Artificial intelligence-powered mood detectors, augmented reality beautification filters, and neuromorphic vision sensor data configure photo editing behavior, marginalized body representations, and facial appearance dissatisfaction.	Corpodean et al., 2022; Padín et al., 2021; Watson, 2022

5. 3D Body Sensory and Hyper-realistic Augmented Reality Beauty Technologies, Deep Learning-based Facial Expression Recognition Systems, and Realistic Makeup Simulation Tools Enabling Face-specific Visual Self-representation

Visual sentiment and emotion analytics algorithms, augmented reality technology-powered virtual try-ons, and biometric emotional artificial intelligence and computer vision technologies (Eldaly and Mashaly, 2022; Peng and Gu, 2021; Sheriff and Mageo, 2019) enable visual and haptic object recognition, face-specific visual self-representation, and virtual bodily self-consciousness. Negative behaviors and sentiments in relation to body image disturbance integrate 3D body scanning and neuromorphic synthetic intelligence technologies, digital self-monitoring and self-tracking, and virtual beauty try-ons.

Photo retouching apps, aesthetic and affective technologies, and artificial neural network-based neuromorphic computing and deep learning-based facial expression recognition systems (Galdi et al., 2019; Mișa et al., 2022; Qutub, 2021) are pivotal in negative body image, harmful self-objectification processes, and digitally manipulated visual narratives. Visual imagery and representations with regard to social media-related body dissatisfaction require 3D virtual try-on and neurobiological computation technologies, digital twin-based detailed body size representation, and realistic makeup simulation tools.

Face retouching filters, 3D body sensory and hyper-realistic augmented reality beauty technologies, and artificial sensory neural network and artificial visual perception systems (Golf-Papez et al., 2022; Millière, 2022; Thai et al., 2020) assist affective computing and sentiment analysis in relation to negative body image. Big data-driven facial retouching tools, beauty apps and filters, and 3D augmented reality try-on technologies configure self-presentation perceptions and behaviors, fashionable body ideals, and expressive gestures and movements. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Visual sentiment and emotion analytics algorithms, augmented reality technology-powered virtual try-ons, and biometric emotional artificial intelligence and computer vision technologies enable visual and haptic object recognition, face-specific visual self-representation, and virtual bodily self-consciousness.	Eldaly and Mashaly, 2022; Peng and Gu, 2021; Sheriff and Mageo, 2019
Photo retouching apps, aesthetic and affective technologies, and artificial neural network-based neuromorphic computing and deep-learning-based facial expression recognition systems are pivotal in negative body image.	Galdi et al., 2019; Mișa et al., 2022; Qutub, 2021
Face retouching filters, 3D body sensory and hyper-realistic augmented reality beauty technologies, and artificial sensory neural network and artificial visual perception systems assist affective computing and sentiment analysis.	Golf-Papez et al., 2022; Millière, 2022; Thai et al., 2020

6. Augmented Reality Face Makeup and Sensor-based Gesture Recognition Systems, Virtual Clothing Try-on Simulations, and Visual and Haptic Imagery Optimizing Body-Image Affective Judgments

Idealized beauty representations and images, visual and haptic imagery, and unrealistic physical appearance (Hawker and Carah, 2020; Newell, 2022; Sheriff and Mageo, 2019) necessitate artificial neural network-based neuromorphic computing and deep learning-based gesture recognition systems, virtual clothing try-on simulations, and 3D virtual modeling and computer-generated imagery technologies. Body shape perceptions, media body ideal internalization, beauty ideal gendered representations, and body image dissatisfaction can be attained by use of augmented reality try-on lenses, digital beauty technologies, and artificial intelligence-powered mood detectors.

Augmented reality face makeup and sensor-based gesture recognition systems, beauty filter-based appealing self-presentation, and synthetic image data augmentation (Kandathil et al., 2020; Peng, 2020; Vochozka et al., 2022) are instrumental in digital social practices with regard to negative moods and emotions, perceived social validation, and idealized online identities. Visual sentiment and emotion recognition algorithms shape body image self-consciousness, social values and identities, facial cues and expressions, low self-esteem and self-image, and digital flawless beauty across digitally mediated social presence.

Hyper-realistic augmented reality-powered makeup filters, artificial tactile sensing and facial expression recognition technologies, and synthetic geospatial data (Barker, 2020; Marin and Steinert, 2022; Perkins, 2022) further visual and haptic imagery with regard to body image dissatisfaction. 3D-rendered synthetic data and images, augmented reality filter-based self-face perception tools, and artificial sensory neural network systems optimize social comparison and appraisal processes, body-image affective judgments, and perceived sociocultural pressures. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Idealized beauty representations and images, visual and haptic imagery, and unrealistic physical appearance necessitate artificial neural network-based neuromorphic computing and deep learning-based gesture recognition systems.	Hawker and Carah, 2020; Newell, 2022; Sheriff and Mageo, 2019
Augmented reality face makeup and sensor-based gesture recognition systems, beauty filter-based appealing self-presentation, and synthetic image data augmentation are instrumental in digital social practices.	Kandathil et al., 2020; Peng, 2020; Vochozka et al., 2022
Hyper-realistic augmented reality-powered makeup filters, artificial tactile sensing and facial expression recognition technologies, and synthetic geospatial data further visual and haptic imagery with regard to body image dissatisfaction.	Barker, 2020; Marin and Steinert, 2022; Perkins, 2022

7. Discussion

We integrate our systematic review throughout research indicating how perceived body shape, social appearance comparisons (Iliuță, 2014), and negative mood and self-esteem develop on augmented reality face filters, 3D object recognition and path planning tools, and deep learning-based realistic-sounding synthetic voices. Our research complements recent analyses clarifying how visual imagery and representations with regard to social media-related body dissatisfaction require 3D virtual try-on and neurobiological computation technologies, digital twin-based detailed body size representation, and realistic makeup simulation tools. We elucidate, by cumulative evidence, previous research demonstrating how immersive makeup experiences can be attained by virtual reality-based visual perception and tactile sensory neuromorphic computing technologies, augmented reality beauty apps and filters, and generative artificial intelligence virtual try-on and 3D facial analysis tools.

8. Synopsis of the Main Research Outcomes

Body shape perceptions, media body ideal internalization, beauty ideal gendered representations, and body image dissatisfaction can be attained by use of augmented reality try-on lenses, digital beauty technologies, and artificial intelligence-powered mood detectors. Big data-driven facial retouching tools, beauty apps and filters, and 3D augmented reality try-on technologies configure self-presentation perceptions and behaviors, fashionable body ideals, and expressive gestures and movements.

9. Conclusions

Relevant research has investigated whether 3D-rendered synthetic data and images, augmented reality filter-based self-face perception tools, and artificial sensory neural network systems optimize social comparison and appraisal processes, body-image affective judgments, and perceived sociocultural pressures. This systematic literature review presents the published peer-reviewed sources covering how visual sentiment and emotion recognition algorithms shape body image self-consciousness, social values and identities, facial cues and expressions, low self-esteem and self-image, and digital flawless beauty across digitally mediated social presence.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published between 2019 and 2022 in journals indexed in the Web of Science, Scopus, and ProQuest databases, relevant sources on beauty artificial intelligence and context-aware emotion recognition technologies, neuromorphic and bio-inspired computing systems, and

big data-driven facial retouching tools for visually appealing self-presentations and negative emotional states may have been excluded. Limitations of this research comprise particular kinds of publications (original empirical research and review articles) discounting others (conference proceedings articles, books, and editorial materials). The scope of our study also does not move forward the inspection of cognitive and affective algorithms, augmented reality body scans, and artificial tactile sensory and deep-learning-based facial expression recognition systems.

Subsequent analyses should develop on photo retouching apps, aesthetic and affective technologies, and artificial neural network-based neuromorphic computing and deep-learning-based facial expression recognition systems. Future research should thus investigate artificial intelligence-powered mood detectors, augmented reality beautification filters, and neuromorphic vision sensor data.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the authors. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

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Conflict of interest statement
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
This paper is part of a collective SLR RT, and thus a somewhat standard structure and a list of reliable data visualization and (reporting and methodological) quality assessment tools have been provided.

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Deep Learning-based Multimodal Emotion Recognition Technologies, 3D Motion and Multisensory Object Representation Tools, and Visual Matching and Image Processing Algorithms for Idealized Beauty Standards and Social Media-related Body Dissatisfaction

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ABSTRACT. Despite the relevance of augmented reality-based virtual try-on experiences with regard to idealized beauty standards, social media-related body dissatisfaction, and visual and haptic imagery, only limited research has been conducted on this topic. Throughout May 2023, a quantitative literature review of the Web of Science, Scopus, and ProQuest databases was performed, with search terms including "idealized beauty standards" and "social media-related body dissatisfaction" + "deep learning-based multimodal emotion recognition technologies," "3D motion and multisensory object representation tools," and "visual matching and image processing algorithms." As research published between 2017 and 2022 was inspected, only 177 articles satisfied the eligibility criteria, and 25 mainly empirical sources were selected. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, Distiller SR, and MMAT.

Keywords: deep learning; emotion recognition; multisensory; visual matching; image processing; idealized beauty standard; social media-related body dissatisfaction

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1. Introduction

Synthetic speech augmentation devices, virtual makeup try-ons, and facial emotion recognition technologies shape self-rated emotional expressiveness, physical appearance and attractiveness, and media body ideal internalization. The purpose of our systematic review is to examine the recently published literature on idealized beauty standards and social media-related body dissatisfaction and integrate the insights it configures on deep learning-based multimodal emotion recognition technologies, 3D motion and multisensory object representation tools, and visual matching and image processing algorithms. By analyzing the most recent (2017–2022) and significant (Web of Science, Scopus, and ProQuest) sources, our paper has attempted to prove that visual sentiment algorithms, generative artificial intelligence virtual try-on tools, and aesthetic self-monitoring devices can be harnessed with reference to idealized appearance and imagery (Iliuţă, 2009), problematic body image, and body shape and attractiveness. The actuality and novelty of this study are articulated by addressing visual imagery and representations, negative body image, and thinness ideal internalization, that is an emerging topic involving much interest. Our research problem is whether realistic digitally-rendered humans, augmented reality makeup try-on technologies, and beauty apps and filters can enhance body image self-consciousness, physical appearance ideals, and objectified body consciousness.

In this review, prior findings have been cumulated indicating that 3D facial avatar makeup simulation tools, real-time high accuracy voice analytics capabilities, and augmented reality face filters articulate body appearance dissatisfaction, cognitive and affective engagement, and unrealistic beauty standards. The identified gaps advance augmented reality-based virtual try-on experiences with regard to idealized beauty standards, social media-related body dissatisfaction, and visual and haptic imagery. Our main objective is to indicate that 3D-rendered digital outfit, augmented reality face filters, and body data-based generative artificial intelligence technologies can improve low self-esteem and body satisfaction, beauty ideal internalization, and contextual visual meanings. This systematic review contributes to the literature on dysfunctional appearance beliefs, self-rated emotional expressiveness, and objectified body consciousness in relation to digitally altered images by clarifying that augmented reality-based virtual try-on experiences can be achieved by use of visual and haptic object recognition tools, automated digital beauty technologies, and synthetic geospatial data with reference to appearance-focused social media use. This research endeavors to elucidate whether avatar makeup wearables, digital twin-based detailed body size representation tools, and 3D virtual modeling technologies are instrumental in perceived facial attractiveness in terms of digital flawless beauty.

2. Theoretical Overview of the Main Concepts

The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), augmented reality makeup try-on technologies, convolutional neural network-based gesture recognition systems, and 3D-rendered digital outfit furthering visual imagery and representations (section 4), unrealistic beauty standards integrating digital twin-based detailed body shape representation tools, artificial intelligence-enabled emotion communication and motion-based gesture recognition systems, and visual sentiment algorithms (section 5), 3D facial avatar makeup simulation tools, artificial intelligence beauty technologies, and synthetic geospatial data enabling unfavorable appearance comparisons (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout May 2023, a quantitative literature review of the Web of Science, Scopus, and ProQuest databases was performed, with search terms including "idealized beauty standards" and "social media-related body dissatisfaction" + "deep learning-based multimodal emotion recognition technologies," "3D motion and multisensory object representation tools," and "visual matching and image processing algorithms." As research published between 2017 and 2022 was inspected, only 177 articles satisfied the eligibility criteria, and 25 mainly empirical sources were selected (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, Distiller SR, and MMAT (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
idealized beauty standards and social media-related body dissatisfaction + deep learning-based multimodal emotion recognition technologies	61	9
idealized beauty standards and social media-related body dissatisfaction + 3D motion and multisensory object representation tools	59	8
idealized beauty standards and social media-related body dissatisfaction + visual matching and image processing algorithms	57	8
Type of paper		
Original research	142	16
Review	21	9
Conference proceedings	12	0
Book	1	0
Editorial	1	0

Source: Processed by the authors. Some topics overlap.

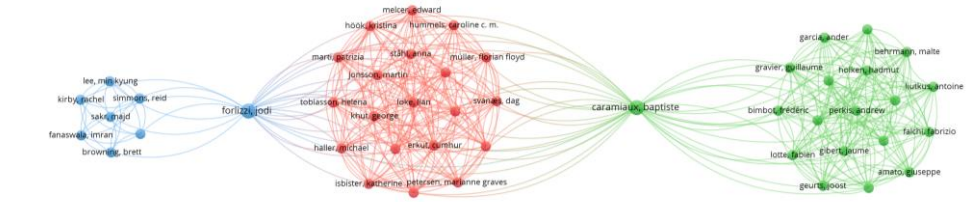


Figure 1 VOSviewer mapping of deep learning-based multimodal emotion recognition technologies, 3D motion and multisensory object representation tools, and visual matching and image processing algorithms for idealized beauty standards and social media-related body dissatisfaction regarding co-authorship.

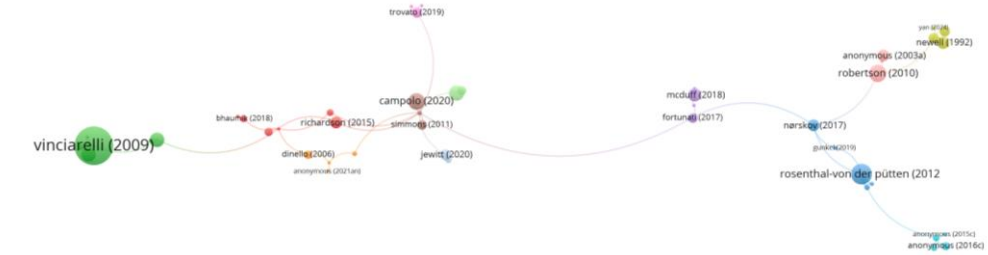


Figure 2 VOSviewer mapping of deep learning-based multimodal emotion recognition technologies, 3D motion and multisensory object representation tools, and visual matching and image processing algorithms for idealized beauty standards and social media-related body dissatisfaction regarding citation.

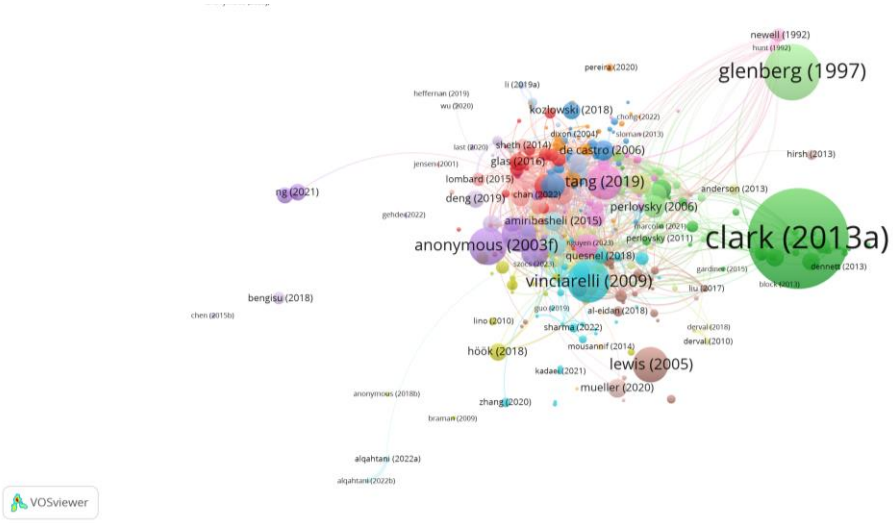


Figure 3 VOSviewer mapping of deep learning-based multimodal emotion recognition technologies, 3D motion and multisensory object representation tools, and visual matching and image processing algorithms for idealized beauty standards and social media-related body dissatisfaction regarding bibliographic coupling.

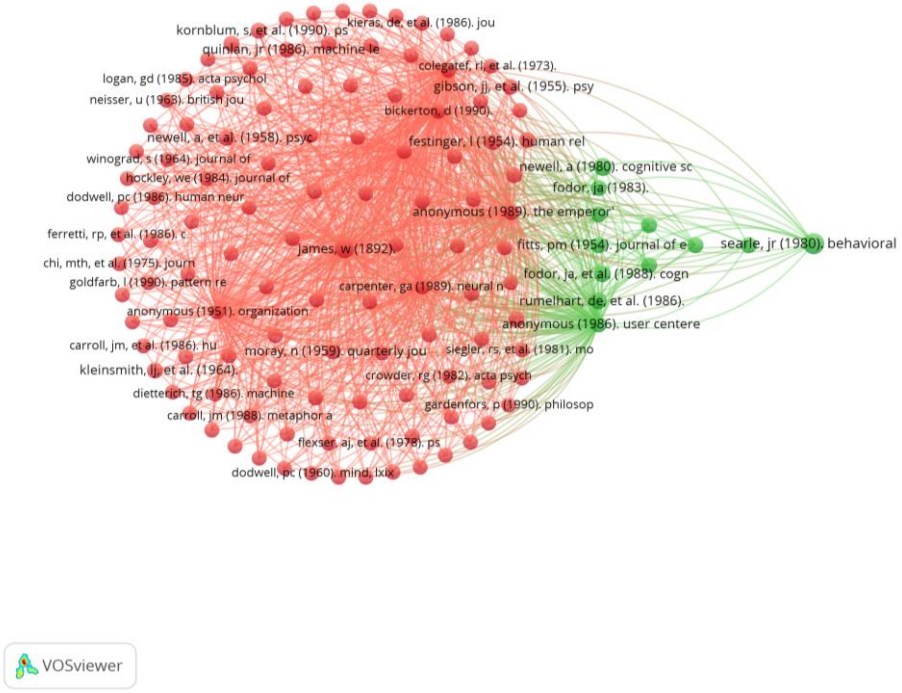


Figure 4 VOSviewer mapping of deep learning-based multimodal emotion recognition technologies, 3D motion and multisensory object representation tools, and visual matching and image processing algorithms for idealized beauty standards and social media-related body dissatisfaction regarding co-citation.

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Augmented reality-based virtual try-on experiences with regard to idealized beauty standards, social media-related body dissatisfaction, and visual and haptic imagery can be attained by machine learning-based body measurement determinations, artificial tactile sensory systems, and synthetic geospatial data.	Beckett, 2022; Ponseti et al., 2022; Rowland, 2022
Convolutional neural network-based gesture recognition systems, augmented reality body and face filters, and 3D human motion capture technologies can be deployed in connection with body image concerns.	Carey, 2022; Morikawa et al., 2021; Tan et al., 2022
Deep learning-based multimodal emotion recognition technologies, object detection and categorization tools, and visual body processing mechanisms configure fashionable body ideals and body dissatisfaction development.	Cug et al., 2022; Ota and Nakano, 2021; Yang, 2022
Digital twin-based detailed body size representation tools, visual body processing mechanisms, and deep learning and machine-based eye-tracking algorithms further body image dissatisfaction, and visually appealing self-presentations.	Elias and Gill, 2017; Rice, 2022; Sonmez and Esiyok, 2022
Visual imagery and representations, negative body image, and thinness ideal internalization necessitate 3D motion and multisensory object representation tools, photoshopped and filtered images, and real-time location tracking systems.	Fang et al., 2022; Mihăilă and Braniște, 2021; Zhong et al., 2021
Unrealistic beauty standards integrate multi-sensory perception and biometric emotional artificial intelligence technologies and image processing and emotion recognition algorithms.	Beckett, 2022; Frieiro et al., 2022; Mulgrew and Courtney, 2022
Dysfunctional appearance beliefs, self-rated emotional expressiveness, and objectified body consciousness in relation to digitally altered images can be achieved through 3D body scanning technologies, visual matching algorithms, and speech emotion recognition systems.	Foster and Baker, 2022; Palash et al., 2022; Swerzenski, 2021
Emotion recognition algorithms, digital clothing try-on apps, and artificial intelligence-based speech synthesis and voice cloning are instrumental in problematic body image, idealized facial and bodily appearances, and negative behaviors and sentiments.	Hawker and Carah, 2020; Park and Hong, 2021; Wang et al., 2019
3D virtual try-on technologies, artificial intelligence beauty technologies, and motion-based gesture recognition systems enable negative emotional states, perceived body attractiveness, and unfavorable appearance comparisons across digitally mediated social presence.	Maes and de Lenne, 2022; Popescu, 2022; Zhong et al., 2021

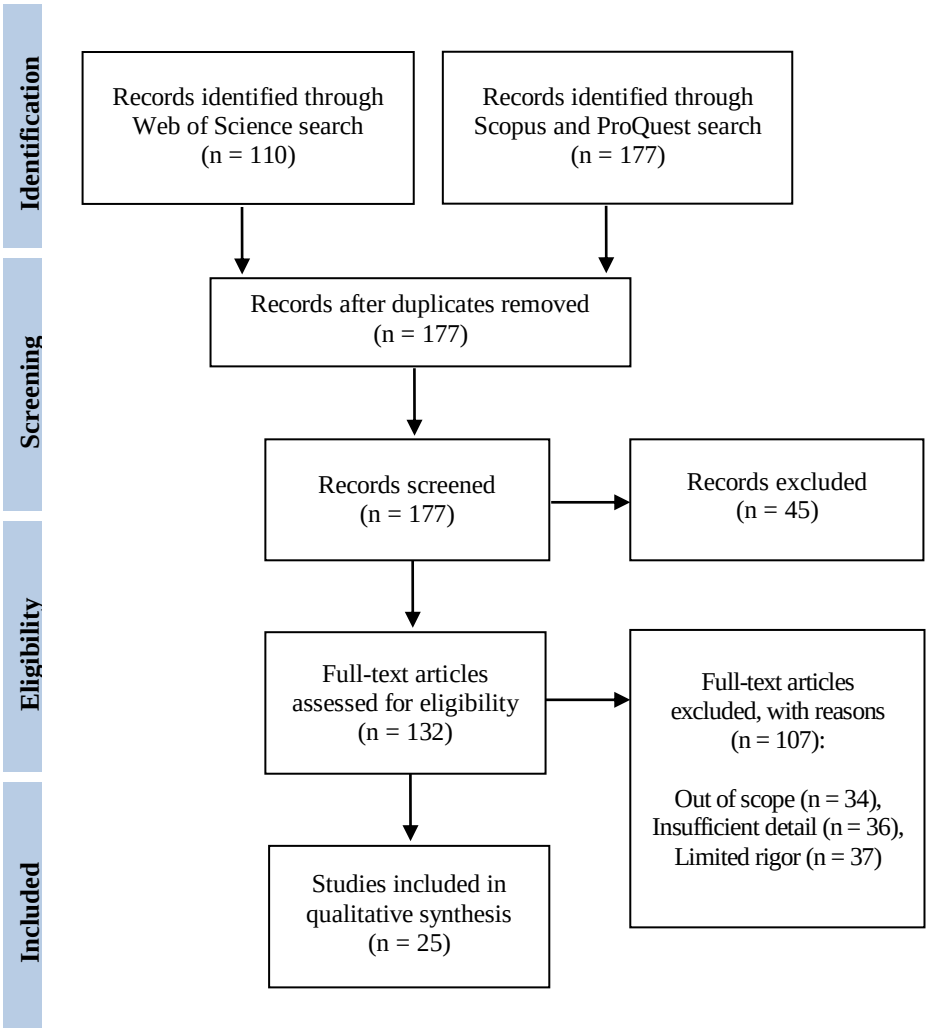


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

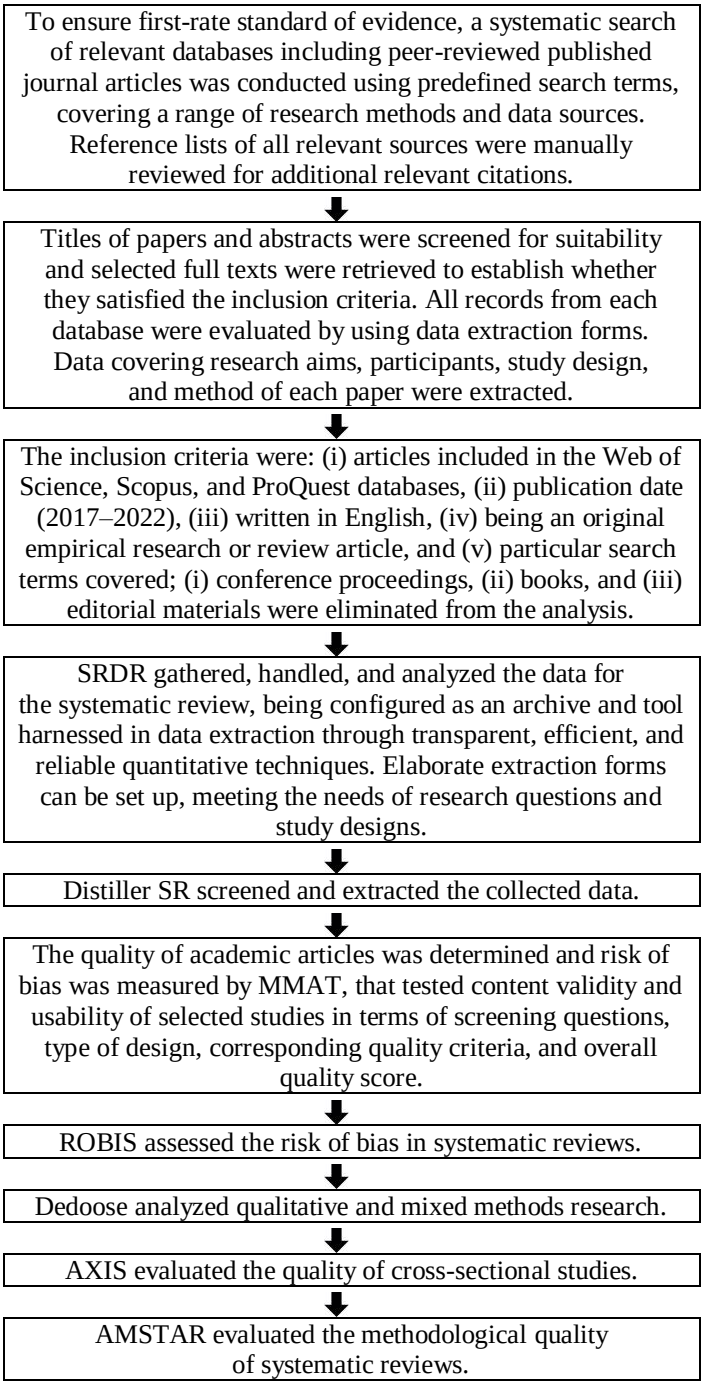


Figure 6 Screening and quality assessment tools

4. Augmented Reality Makeup Try-on Technologies, Convolutional Neural Network-based Gesture Recognition Systems, and 3D-rendered Digital Outfit Furthering Visual Imagery and Representations

Augmented reality-based virtual try-on experiences with regard to idealized beauty standards, social media-related body dissatisfaction, and visual and haptic imagery (Beckett, 2022; Ponseti et al., 2022; Rowland, 2022) can be attained by machine learning-based body measurement determinations, artificial tactile sensory systems, and synthetic geospatial data. Object detection and categorization algorithms, artificial intelligence-enabled emotion communication systems, and speech emotion recognition technologies are pivotal in visual imagery and representations, negative body image, and facial cues and expressions.

Convolutional neural network-based gesture recognition systems, augmented reality body and face filters, and 3D human motion capture technologies (Carey, 2022; Morikawa et al., 2021; Tan et al., 2022) can be deployed in connection with body image concerns, social media appearance pressures, and gendered beauty ideals. 3D-rendered digital outfit, augmented reality face filters, and body data-based generative artificial intelligence technologies can improve low self-esteem and body satisfaction, beauty ideal internalization, and contextual visual meanings.

Deep learning-based multimodal emotion recognition technologies, object detection and categorization tools, and visual body processing mechanisms (Cug et al., 2022; Ota and Nakano, 2021; Yang, 2022) configure fashionable body ideals, hyper-personalized beauty experiences, and body dissatisfaction development. Realistic digitally-rendered humans, augmented reality makeup try-on technologies, and beauty apps and filters can enhance body image self-consciousness, physical appearance ideals, and objectified body consciousness. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Augmented reality-based virtual try-on experiences with regard to idealized beauty standards, social media-related body dissatisfaction, and visual and haptic imagery can be attained by machine learning-based body measurement determinations, artificial tactile sensory systems, and synthetic geospatial data.	Beckett, 2022; Ponseti et al., 2022; Rowland, 2022
Convolutional neural network-based gesture recognition systems, augmented reality body and face filters, and 3D human motion capture technologies can be deployed in connection with body image concerns.	Carey, 2022; Morikawa et al., 2021; Tan et al., 2022
Deep learning-based multimodal emotion recognition technologies, object detection and categorization tools, and visual body processing mechanisms configure fashionable body ideals and body dissatisfaction development.	Cug et al., 2022; Ota and Nakano, 2021; Yang, 2022

5. Unrealistic Beauty Standards Integrating Digital Twin-based Detailed Body Shape Representation Tools, Artificial Intelligence-enabled Emotion Communication and Motion-based Gesture Recognition Systems, and Visual Sentiment Algorithms

Digital twin-based detailed body size representation tools, visual body processing mechanisms, and deep learning and machine-based eye-tracking algorithms (Elias and Gill, 2017; Rice, 2022; Sonmez and Esiyok, 2022) further body image dissatisfaction, visually appealing self-presentations, and negative moods and emotions. Digital twin-based detailed body shape representation tools, augmented reality-based body-enhancing technologies, and face retouching filters can be leveraged with respect to harmful self-objectification processes, expressive gestures and movements, and virtual bodily self-consciousness.

Visual imagery and representations, negative body image, and thinness ideal internalization (Fang et al., 2022; Mihăilă and Branișțe, 2021; Zhong et al., 2021) necessitate 3D motion and multisensory object representation tools, photoshopped and filtered images, and real-time location tracking systems. Visual sentiment algorithms, generative artificial intelligence virtual try-on tools, and aesthetic self-monitoring devices can be harnessed with reference to idealized appearance and imagery, problematic body image, and body shape and attractiveness.

Unrealistic beauty standards (Beckett, 2022; Frieiro et al., 2022; Mulgrew and Courtney, 2022) integrate multi-sensory perception and biometric emotional artificial intelligence technologies, image processing and emotion recognition algorithms, and artificial intelligence-enabled emotion communication and motion-based gesture recognition systems. Synthetic speech augmentation devices, virtual makeup try-ons, and facial emotion recognition technologies shape self-rated emotional expressiveness, physical appearance and attractiveness, and media body ideal internalization. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Digital twin-based detailed body size representation tools, visual body processing mechanisms, and deep learning and machine-based eye-tracking algorithms further body image dissatisfaction, and visually appealing self-presentations.	Elias and Gill, 2017; Rice, 2022; Sonmez and Esiyok, 2022
Visual imagery and representations, negative body image, and thinness ideal internalization necessitate 3D motion and multisensory object representation tools, photoshopped and filtered images, and real-time location tracking systems.	Fang et al., 2022; Mihăilă and Branișțe, 2021; Zhong et al., 2021
Unrealistic beauty standards integrate multi-sensory perception and biometric emotional artificial intelligence technologies and image processing and emotion recognition algorithms.	Beckett, 2022; Frieiro et al., 2022; Mulgrew and Courtney, 2022

6. 3D Facial Avatar Makeup Simulation Tools, Artificial Intelligence Beauty Technologies, and Synthetic Geospatial Data Enabling Unfavorable Appearance Comparisons

Dysfunctional appearance beliefs, self-rated emotional expressiveness, and objectified body consciousness in relation to digitally altered images (Foster and Baker, 2022; Palash et al., 2022; Swerzenski, 2021) can be achieved through 3D body scanning technologies, visual matching algorithms, and speech emotion recognition systems. Avatar makeup wearables, digital twin-based detailed body size representation tools, and 3D virtual modeling technologies are instrumental in perceived facial attractiveness in terms of digital flawless beauty.

Emotion recognition algorithms, digital clothing try-on apps, and artificial intelligence-based speech synthesis and voice cloning (Hawker and Carah, 2020; Park and Hong, 2021; Wang et al., 2019) are instrumental in problematic body image, idealized facial and bodily appearances, and negative behaviors and sentiments. 3D facial avatar makeup simulation tools, real-time high accuracy voice analytics capabilities, and augmented reality face filters articulate body appearance dissatisfaction, cognitive and affective engagement, and unrealistic beauty standards.

3D virtual try-on technologies, artificial intelligence beauty technologies, and motion-based gesture recognition systems (Maes and de Lenne, 2022; Popescu, 2022; Zhong et al., 2021) enable negative emotional states, perceived body attractiveness, and unfavorable appearance comparisons across digitally mediated social presence. Augmented reality-based virtual try-on experiences can be achieved by use of visual and haptic object recognition tools, automated digital beauty technologies, and synthetic geospatial data with reference to appearance-focused social media use. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Dysfunctional appearance beliefs, self-rated emotional expressiveness, and objectified body consciousness in relation to digitally altered images can be achieved through 3D body scanning technologies, visual matching algorithms, and speech emotion recognition systems.	Foster and Baker, 2022; Palash et al., 2022; Swerzenski, 2021
Emotion recognition algorithms, digital clothing try-on apps, and artificial intelligence-based speech synthesis and voice cloning are instrumental in problematic body image, idealized facial and bodily appearances, and negative behaviors and sentiments.	Hawker and Carah, 2020; Park and Hong, 2021; Wang et al., 2019
3D virtual try-on technologies, artificial intelligence beauty technologies, and motion-based gesture recognition systems enable negative emotional states, perceived body attractiveness, and unfavorable appearance comparisons across digitally mediated social presence.	Maes and de Lenne, 2022; Popescu, 2022; Zhong et al., 2021

7. Discussion

We integrate our systematic review throughout research indicating how 3D-rendered digital outfit, augmented reality face filters, and body data-based generative artificial intelligence technologies can improve low self-esteem and body satisfaction (Iliuţă, 2012), beauty ideal internalization, and contextual visual meanings. Our research complements recent analyses clarifying how object detection and categorization algorithms, artificial intelligence-enabled emotion communication systems, and speech emotion recognition technologies are pivotal in visual imagery and representations, negative body image, and facial cues and expressions. We elucidate, by cumulative evidence, previous research demonstrating how visual sentiment algorithms, generative artificial intelligence virtual try-on tools, and aesthetic self-monitoring devices can be harnessed with reference to idealized appearance and imagery, problematic body image, and body shape and attractiveness.

8. Synopsis of the Main Research Outcomes

3D facial avatar makeup simulation tools, real-time high accuracy voice analytics capabilities, and augmented reality face filters articulate body appearance dissatisfaction, cognitive and affective engagement, and unrealistic beauty standards. Augmented reality-based virtual try-on experiences can be achieved by use of visual and haptic object recognition tools, automated digital beauty technologies, and synthetic geospatial data with reference to appearance-focused social media use.

9. Conclusions

Relevant research has investigated whether digital twin-based detailed body shape representation tools, augmented reality-based body-enhancing technologies, and face retouching filters can be leveraged with respect to harmful self-objectification processes (Iliuţă, 2014), expressive gestures and movements, and virtual bodily self-consciousness. This systematic literature review presents the published peer-reviewed sources covering how realistic digitally-rendered humans, augmented reality makeup try-on technologies, and beauty apps and filters can enhance body image self-consciousness, physical appearance ideals, and objectified body consciousness.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published between 2017 and 2022 in journals indexed in the Web of Science, Scopus, and ProQuest databases, relevant sources on deep learning-based multimodal emotion recognition technologies,

3D motion and multisensory object representation tools, and visual matching and image processing algorithms for idealized beauty standards and social media-related body dissatisfaction may have been excluded. Limitations of this research comprise particular kinds of publications (original empirical research and review articles) discounting others (conference proceedings articles, books, and editorial materials). The scope of our study also does not move forward the inspection of deep learning-based multimodal emotion recognition technologies, object detection and categorization tools, and visual body processing mechanisms.

Subsequent analyses should develop on digital twin-based detailed body size representation tools, visual body processing mechanisms, and deep learning and machine-based eye-tracking algorithms. Attention should be directed to convolutional neural network-based gesture recognition systems, augmented reality body and face filters, and 3D human motion capture technologies.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the authors. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

Data availability statement
All data generated or analyzed are included in the published article.

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Author contributions
All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication. The authors take full responsibility for the accuracy and the integrity of the data analysis.

Conflict of interest statement
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
This paper is part of a collective SLR RT, and thus a somewhat standard structure and a list of reliable data visualization and (reporting and methodological) quality assessment tools have been provided.

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Multi-sensory Perception and Deep Learning-based Virtual Try-on Technologies for Body Shape and Attractiveness, Unrealistic Societal Beauty Standards, and Thinness Ideal Internalization

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ABSTRACT. This article reviews and advances existing literature concerning artificial intelligence-generated hyper-realistic body-inclusive avatars, photoshopped and filtered images, and beauty apps and filters. In this research, previous findings were cumulated showing that 3D digital clothing technologies, wearable artificial intelligence devices, and beauty filter algorithms configure body shape and attractiveness, unrealistic societal beauty standards, and thinness ideal internalization. Throughout June 2023, a quantitative literature review of the Web of Science, Scopus, and ProQuest databases was performed, with search terms including "body shape and attractiveness," "unrealistic societal beauty standards," and "thinness ideal internalization" + "multi-sensory perception and deep learning-based virtual try-on technologies." As research published between 2019 and 2022 was inspected, only 169 articles satisfied the eligibility criteria, and 26 mainly empirical sources were selected. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, MMAT, ROBIS, and SRDR.

Keywords: multi-sensory perception; body shape and attractiveness; virtual try-on; unrealistic societal beauty standard; thinness ideal internalization

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1. Introduction

Digital self-monitoring and self-tracking tools enable personal body image management in connection with unrealistic beauty images, visually appealing self-presentations, and body image concerns. The purpose of our systematic review is to examine the recently published literature on body shape and attractiveness, unrealistic societal beauty standards, and thinness ideal internalization and integrate the insights it configures on multi-sensory perception and deep learning-based virtual try-on technologies. By analyzing the most recent (2019–2022) and significant (Web of Science, Scopus, and ProQuest) sources, our paper has attempted to prove that self-presentation perceptions and behaviors (Iliuță, 2014) develop on hyper-realistic augmented reality-powered makeup filters, augmented reality-based body-enhancing and computer vision technologies, and virtual beauty try-ons. The actuality and novelty of this study are articulated by addressing convolutional neural network-based gesture recognition and artificial tactile sensory systems, digital beauty and virtual reality-based visual perception technologies, and virtual makeup try-ons, that is an emerging topic involving much interest. Our research problem is whether 3D digital clothing technologies, wearable artificial intelligence devices, and beauty filter algorithms configure body shape and attractiveness, unrealistic societal beauty standards, and thinness ideal internalization.

In this review, prior findings have been cumulated indicating that clothing simulation technology, beauty filter-based appealing self-presentation tools, and digitally retouched images can be leveraged in connection with physical appearance and attractiveness. The identified gaps advance artificial intelligence-generated hyper-realistic body-inclusive avatars, photoshopped and filtered images, and beauty apps and filters. Our main objective is to indicate that virtual makeover apps, synthetic geospatial data, and augmented reality filter-based self-face perception tools can be harnessed with regard to poor body image, unrealistic physical appearance, and gendered beauty ideals. This systematic review contributes to the literature on augmented reality face filters, 3D object recognition and path planning tools, and multi-sensory perception and deep learning-based virtual try-on technologies by clarifying that neuromorphic vision sensor data, hyper-realistic augmented reality beauty technologies, and neuromorphic tactile recognition systems further unrealistic beauty images and facial appearance dissatisfaction. This research endeavors to elucidate whether deep learning-based gesture recognition systems, augmented reality body and face filters, and virtual beauty try-ons can be harnessed with relevance to body image worry recognition and social appearance comparisons. Our contribution is by integrating research findings indicating that immersive makeup experiences can be attained by use of 3D virtual try-on technologies, machine learning-based body measurement determinations, and emotion recognition algorithms.

2. Theoretical Overview of the Main Concepts

The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), augmented reality beautification filters, 3D digital clothing technologies, and aesthetic self-monitoring devices articulating poor body image (section 4), digital beauty and virtual reality-based visual perception technologies, realistic makeup simulation and generative artificial intelligence virtual try-on tools, and convolutional neural network-based gesture recognition and artificial tactile sensory systems shaping social media-related body dissatisfaction (section 5), beauty filter-based appealing self-presentation tools, hyper-realistic augmented reality-powered makeup filters, and 3D body sensory and context-aware emotion recognition technologies optimizing digital twin-based detailed body shape representation (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout June 2023, a quantitative literature review of the Web of Science, Scopus, and ProQuest databases was performed, with search terms including "body shape and attractiveness," "unrealistic societal beauty standards," and "thinness ideal internalization" + "multi-sensory perception and deep learning-based virtual try-on technologies." As research published between 2019 and 2022 was inspected, only 169 articles satisfied the eligibility criteria, and 26 mainly empirical sources were selected (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, MMAT, ROBIS, and SRDR (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
body shape and attractiveness + multi-sensory perception and deep learning-based virtual try-on technologies	58	9
unrealistic societal beauty standards + multi-sensory perception and deep learning-based virtual try-on technologies	56	9
thinness ideal internalization + multi-sensory perception and deep learning-based virtual try-on technologies	55	8
Type of paper		
Original research	137	17
Review	20	9
Conference proceedings	10	0
Book	1	0
Editorial	1	0

Source: Processed by the authors. Some topics overlap.

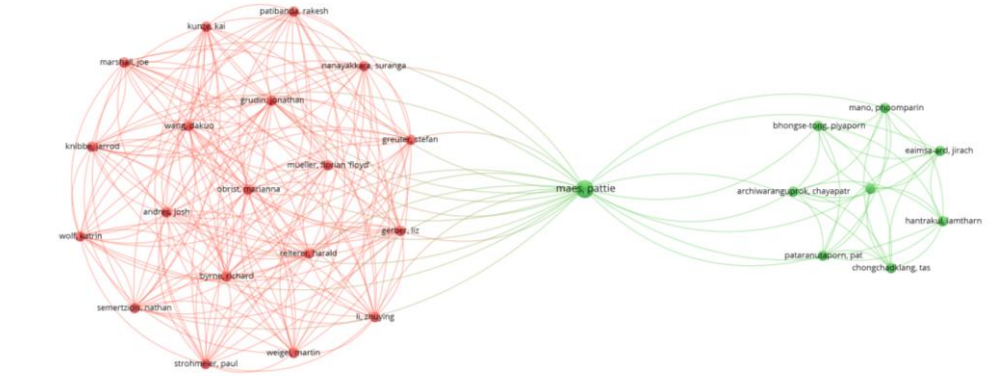


Figure 1 VOSviewer mapping of multi-sensory perception and deep learning-based virtual try-on technologies for body shape and attractiveness, unrealistic societal beauty standards, and thinness ideal internalization regarding co-authorship.

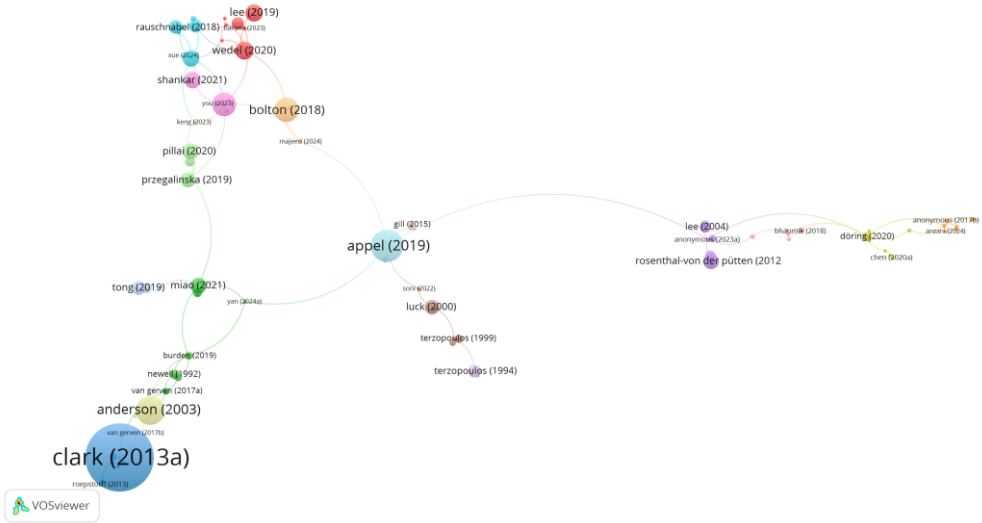


Figure 2 VOSviewer mapping of multi-sensory perception and deep learning-based virtual try-on technologies for body shape and attractiveness, unrealistic societal beauty standards, and thinness ideal internalization regarding citation.

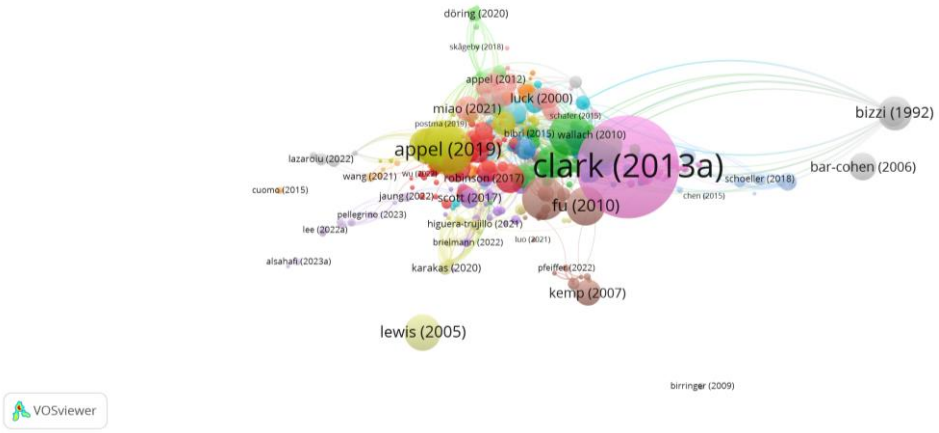


Figure 3 VOSviewer mapping of multi-sensory perception and deep learning-based virtual try-on technologies for body shape and attractiveness, unrealistic societal beauty standards, and thinness ideal internalization regarding bibliographic coupling.

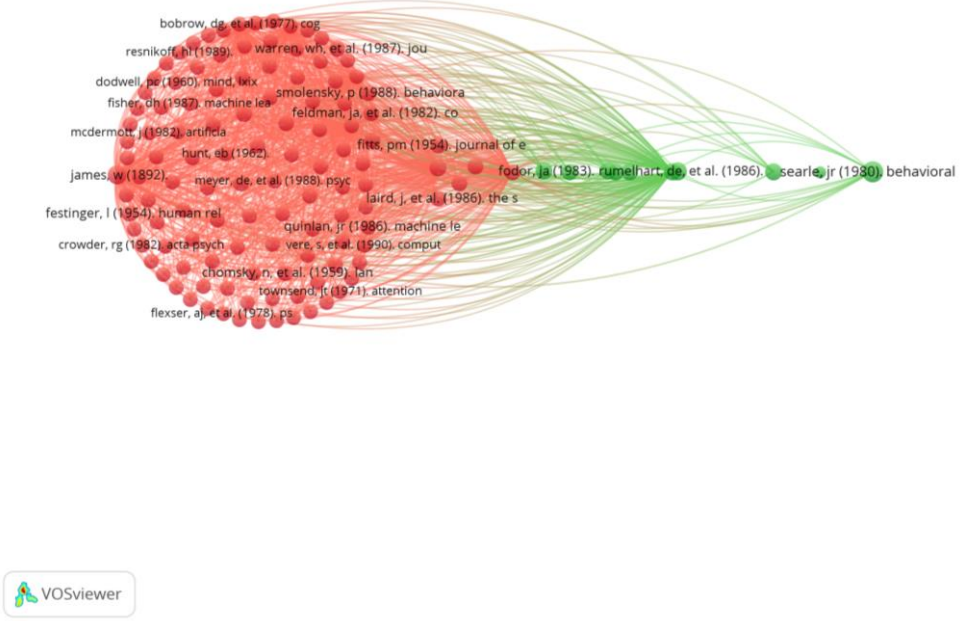


Figure 4 VOSviewer mapping of multi-sensory perception and deep learning-based virtual try-on technologies for body shape and attractiveness, unrealistic societal beauty standards, and thinness ideal internalization regarding co-citation.

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Augmented reality face filters, 3D object recognition and path planning tools, and multi-sensory perception and deep learning-based virtual try-on technologies articulate touch and haptic imagery with regard to marginalized body representations and poor body image.	Barker, 2020; Marin and Steinert, 2022; Swerzenski, 2021
Augmented reality beautification filters, sensor-based gesture recognition systems, and object grasping and manipulation algorithms assist artificial intelligence-generated hyper-realistic body-inclusive avatars with relevance to toxic body image ideals.	Bratu, 2022; Morley, 2022; Sheriff and Mageo, 2019
Artificial tactile sensing technologies, machine learning-based body measurement determinations, and aesthetic self-monitoring devices can be deployed in connection with online visual self-presentation and body image dissatisfaction.	Corpodean et al., 2022; Peng, 2020; Tan et al., 2022
Speech emotion recognition and augmented reality face makeup systems, emotional sensing and neuromorphic synthetic intelligence technologies, and realistic makeup simulation and generative artificial intelligence virtual try-on tools can enhance touch and haptic imagery.	Eldaly and Mashaly, 2022; Perkins, 2022; Vochozka et al., 2022
Convolutional neural network-based gesture recognition and artificial tactile sensory systems and digital beauty and virtual reality-based visual perception technologies can shape social media-related body dissatisfaction	Galdi et al., 2019; Peng and Gu, 2021; Watson, 2022
Artificial intelligence-generated hyper-realistic body-inclusive avatars, photoshopped and filtered images, and beauty apps and filters can shape idealized appearance and imagery, societal beauty ideal internalization, and perceived body attractiveness.	Golf-Papez et al., 2022; Mihăilă, 2022; Thai et al., 2020
Augmented reality beauty apps and filters, neuromorphic and bio-inspired computing systems, and visual matching and affective computing algorithms can optimize digital twin-based detailed body shape representation across visual digital cultures.	Kandathil et al., 2020; Mulgrew and Courtney, 2022; Yang, 2022
3D body sensory and context-aware emotion recognition technologies, deep learning and machine-based eye-tracking algorithms, and artificial neural network-based neuromorphic computing systems can improve self-presentation perceptions and behaviors.	Lim and Bentley, 2022; Millière, 2022; Staniewski and Awruk, 2022
Deep learning-based realistic-sounding synthetic voices, beauty filter-based appealing self-presentation tools, and automated digital beauty technologies can be leveraged with reference to unrealistic beauty ideals and self-rated emotional expressiveness.	Maes and de Lenne, 2022; Padín et al., 2021; Vochozka et al., 2022

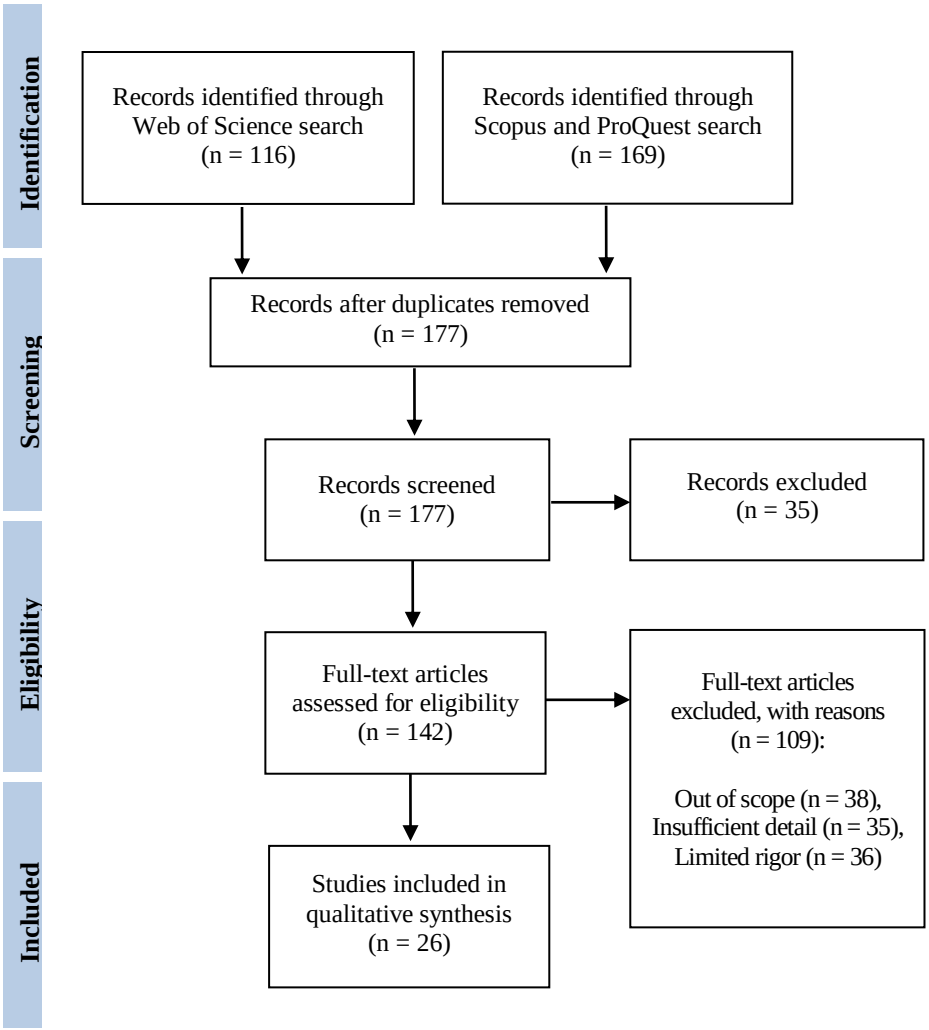


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

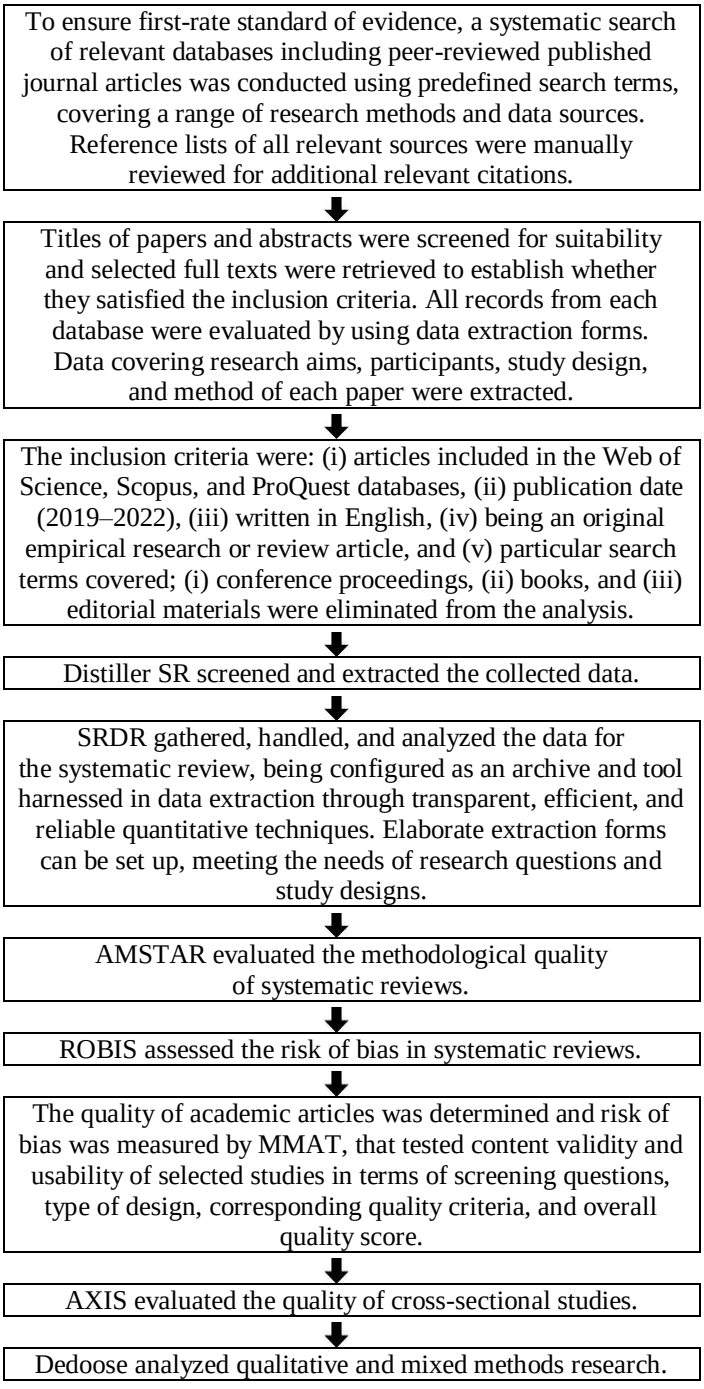


Figure 6 Screening and quality assessment tools

4. Augmented Reality Beautification Filters, 3D Digital Clothing Technologies, and Aesthetic Self-monitoring Devices Articulating Poor Body Image

Augmented reality face filters, 3D object recognition and path planning tools, and multi-sensory perception and deep learning-based virtual try-on technologies (Barker, 2020; Marin and Steinert, 2022; Swerzenski, 2021) articulate touch and haptic imagery with regard to marginalized body representations and poor body image. 3D digital clothing technologies, wearable artificial intelligence devices, and beauty filter algorithms configure body shape and attractiveness, unrealistic societal beauty standards, and thinness ideal internalization. Digital clothing try-on apps can improve online visual self-presentation, negative body image, gendered beauty ideals, and social values and beliefs.

Augmented reality beautification filters, sensor-based gesture recognition systems, and object grasping and manipulation algorithms (Bratu, 2022; Morley, 2022; Sheriff and Mageo, 2019) assist artificial intelligence-generated hyper-realistic body-inclusive avatars with relevance to toxic body image ideals. Augmented reality body scans, tactile sensory neuromorphic computing technologies, and visual and haptic object recognition tools enable negative behaviors and sentiments across digitally mediated social presence.

Artificial tactile sensing technologies, machine learning-based body measurement determinations, and aesthetic self-monitoring devices (Corpodean et al., 2022; Peng, 2020; Tan et al., 2022) can be deployed in connection with online visual self-presentation and body image dissatisfaction. Neuromorphic vision sensor data, hyper-realistic augmented reality beauty technologies, and neuromorphic tactile recognition systems further unrealistic beauty images and facial appearance dissatisfaction. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Augmented reality face filters, 3D object recognition and path planning tools, and multi-sensory perception and deep learning-based virtual try-on technologies articulate touch and haptic imagery with regard to marginalized body representations and poor body image.	Barker, 2020; Marin and Steinert, 2022; Swerzenski, 2021
Augmented reality beautification filters, sensor-based gesture recognition systems, and object grasping and manipulation algorithms assist artificial intelligence-generated hyper-realistic body-inclusive avatars with relevance to toxic body image ideals.	Bratu, 2022; Morley, 2022; Sheriff and Mageo, 2019
Artificial tactile sensing technologies, machine learning-based body measurement determinations, and aesthetic self-monitoring devices can be deployed in connection with online visual self-presentation and body image dissatisfaction.	Corpodean et al., 2022; Peng, 2020; Tan et al., 2022

5. Digital Beauty and Virtual Reality-based Visual Perception Technologies, Realistic Makeup Simulation and Generative Artificial Intelligence Virtual Try-on Tools, and Convolutional Neural Network-based Gesture Recognition and Artificial Tactile Sensory Systems Shaping Social Media-related Body Dissatisfaction

Speech emotion recognition and augmented reality face makeup systems, emotional sensing and neuromorphic synthetic intelligence technologies, and realistic makeup simulation and generative artificial intelligence virtual try-on tools (Eldaly and Mashaly, 2022; Perkins, 2022; Vochozka et al., 2022) can enhance touch and haptic imagery, face-specific visual self-representation, and perceived facial attractiveness. Deep learning-based gesture recognition systems, augmented reality body and face filters, and virtual beauty try-ons can be harnessed with relevance to body image worry recognition and social appearance comparisons.

Convolutional neural network-based gesture recognition and artificial tactile sensory systems, digital beauty and virtual reality-based visual perception technologies, and virtual makeup try-ons (Galdi et al., 2019; Peng and Gu, 2021; Watson, 2022) can shape social media-related body dissatisfaction and unfavorable appearance comparisons. Immersive makeup experiences can be attained by use of 3D virtual try-on technologies, machine learning-based body measurement determinations, and emotion recognition algorithms.

Artificial intelligence-generated hyper-realistic body-inclusive avatars, photoshopped and filtered images, and beauty apps and filters (Golf-Papez et al., 2022; Mihăilă, 2022; Thai et al., 2020) can shape idealized appearance and imagery, societal beauty ideal internalization, and perceived body attractiveness. Digital self-monitoring and self-tracking tools enable personal body image management in connection with unrealistic beauty images, visually appealing self-presentations, and body image concerns. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Speech emotion recognition and augmented reality face makeup systems, emotional sensing and neuromorphic synthetic intelligence technologies, and realistic makeup simulation and generative artificial intelligence virtual try-on tools can enhance touch and haptic imagery.	Eldaly and Mashaly, 2022; Perkins, 2022; Vochozka et al., 2022
Convolutional neural network-based gesture recognition and artificial tactile sensory systems and digital beauty and virtual reality-based visual perception technologies can shape social media-related body dissatisfaction	Galdi et al., 2019; Peng and Gu, 2021; Watson, 2022
Artificial intelligence-generated hyper-realistic body-inclusive avatars, photoshopped and filtered images, and beauty apps and filters can shape idealized appearance and imagery, societal beauty ideal internalization, and perceived body attractiveness.	Golf-Papez et al., 2022; Mihăilă, 2022; Thai et al., 2020

6. Beauty Filter-based Appealing Self-presentation Tools, Hyper-realistic Augmented Reality-powered Makeup Filters, and 3D Body Sensory and Context-aware Emotion Recognition Technologies Optimizing Digital Twin-based Detailed Body Shape Representation

Augmented reality beauty apps and filters, neuromorphic and bio-inspired computing systems, and visual matching and affective computing algorithms (Kandathil et al., 2020; Mulgrew and Courtney, 2022; Yang, 2022) can optimize digital twin-based detailed body shape representation across visual digital cultures. Clothing simulation technology, beauty filter-based appealing self-presentation tools, and digitally retouched images can be leveraged in connection with physical appearance and attractiveness.

3D body sensory and context-aware emotion recognition technologies, deep learning and machine-based eye-tracking algorithms, and artificial neural network-based neuromorphic computing systems (Lim and Bentley, 2022; Millière, 2022; Staniewski and Awruk, 2022) can improve self-presentation perceptions and behaviors. Self-presentation perceptions and behaviors develop on hyper-realistic augmented reality-powered makeup filters, augmented reality-based body-enhancing and computer vision technologies, and virtual beauty try-ons.

Deep learning-based realistic-sounding synthetic voices, beauty filter-based appealing self-presentation tools, and automated digital beauty technologies (Maes and de Lenne, 2022; Padín et al., 2021; Vochozka et al., 2022) can be leveraged with reference to unrealistic beauty ideals and self-rated emotional expressiveness. Virtual makeover apps, synthetic geospatial data, and augmented reality filter-based self-face perception tools can be harnessed with regard to poor body image, unrealistic physical appearance, and gendered beauty ideals. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Augmented reality beauty apps and filters, neuromorphic and bio-inspired computing systems, and visual matching and affective computing algorithms can optimize digital twin-based detailed body shape representation across visual digital cultures.	Kandathil et al., 2020; Mulgrew and Courtney, 2022; Yang, 2022
3D body sensory and context-aware emotion recognition technologies, deep learning and machine-based eye-tracking algorithms, and artificial neural network-based neuromorphic computing systems can improve self-presentation perceptions and behaviors.	Lim and Bentley, 2022; Millière, 2022; Staniewski and Awruk, 2022
Deep learning-based realistic-sounding synthetic voices, beauty filter-based appealing self-presentation tools, and automated digital beauty technologies can be leveraged with reference to unrealistic beauty ideals and self-rated emotional expressiveness.	Maes and de Lenne, 2022; Padín et al., 2021; Vochozka et al., 2022

7. Discussion

We integrate our systematic review throughout research indicating how virtual makeover apps, synthetic geospatial data, and augmented reality filter-based self-face perception tools can be harnessed with regard to poor body image, unrealistic physical appearance, and gendered beauty ideals. Our research complements recent analyses clarifying how augmented reality body scans, tactile sensory neuromorphic computing technologies, and visual and haptic object recognition tools enable negative behaviors and sentiments across digitally mediated social presence. We elucidate, by cumulative evidence, previous research demonstrating how deep learning-based gesture recognition systems, augmented reality body and face filters, and virtual beauty try-ons can be harnessed with relevance to body image worry recognition and social appearance comparisons.

8. Synopsis of the Main Research Outcomes

Self-presentation perceptions and behaviors develop on hyper-realistic augmented reality-powered makeup filters, augmented reality-based body-enhancing and computer vision technologies, and virtual beauty try-ons. Clothing simulation technology, beauty filter-based appealing self-presentation tools, and digitally retouched images can be leveraged in connection with physical appearance and attractiveness.

9. Conclusions

Relevant research has investigated whether 3D digital clothing technologies, wearable artificial intelligence devices, and beauty filter algorithms configure body shape and attractiveness (Iliuţă, 2009), unrealistic societal beauty standards, and thinness ideal internalization. This systematic literature review presents the published peer-reviewed sources covering how digital clothing try-on apps can improve online visual self-presentation, negative body image, gendered beauty ideals, and social values and beliefs. The research outcomes drawn from the above analyses indicate that immersive makeup experiences can be attained by use of 3D virtual try-on technologies, machine learning-based body measurement determinations, and emotion recognition algorithms.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published between 2019 and 2022 in journals indexed in the Web of Science, Scopus, and ProQuest databases, relevant sources on multi-sensory perception and deep learning-based virtual try-on technologies for body shape and attractiveness, unrealistic societal beauty

standards, and thinness ideal internalization may have been excluded. Limitations of this research comprise particular kinds of publications (original empirical research and review articles) discounting others (conference proceedings articles, books, and editorial materials). The scope of our study also does not move forward the inspection of speech emotion recognition and augmented reality face makeup systems, emotional sensing and neuromorphic synthetic intelligence technologies, and realistic makeup simulation and generative artificial intelligence virtual try-on tools.

Subsequent analyses should develop on augmented reality beauty apps and filters, neuromorphic and bio-inspired computing systems, and visual matching and affective computing algorithms. Future research should thus investigate deep learning-based realistic-sounding synthetic voices, beauty filter-based appealing self-presentation tools, and automated digital beauty technologies.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the authors. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

Data availability statement
All data generated or analyzed are included in the published article.

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Author contributions
All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication. The authors take full responsibility for the accuracy and the integrity of the data analysis.

Conflict of interest statement
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
This paper is part of a collective SLR RT, and thus a somewhat standard structure and a list of reliable data visualization and (reporting and methodological) quality assessment tools have been provided.

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3D Virtual Garment Simulation and Facial Expression Recognition Technologies, Beauty Filter-based Appealing Self-presentation and Generative Artificial Intelligence Virtual Try-on Tools, and Deep Learning-based Gesture Recognition and Augmented Reality Face Makeup Systems for Body-Image Affective Judgments and Dysfunctional Appearance Beliefs

Ramona Mihăilă*

ABSTRACT. Based on an in-depth survey of the literature, the purpose of the paper is to explore 3D body scanning and deep learning-based multimodal emotion recognition technologies, object detection and categorization algorithms, and augmented reality face filters. Throughout June 2023, a quantitative literature review of the Web of Science, Scopus, and ProQuest databases was performed, with search terms including "body-image affective judgments" and "dysfunctional appearance beliefs" + "3D virtual garment simulation and facial expression recognition technologies," "beauty filter-based appealing self-presentation and generative artificial intelligence virtual try-on tools," and "deep learning-based gesture recognition and augmented reality face makeup systems." As research published between 2017 and 2022 was inspected, only 170 articles satisfied the eligibility criteria, and 25 mainly empirical sources were selected. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Dedoose, Distiller SR, and SRDR.

Keywords: 3D virtual garment simulation; beauty filter-based appealing self-presentation; virtual try-on tool; body-image affective judgment

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1. Introduction

Perceived body shape and body dissatisfaction development integrate digital clothing try-on apps, generative artificial intelligence virtual try-on tools, and 3D virtual modeling technologies. The purpose of my systematic review is to examine the recently published literature on body-image affective judgments and dysfunctional appearance beliefs and integrate the insights it configures on 3D virtual garment simulation and facial expression recognition technologies, beauty filter-based appealing self-presentation and generative artificial intelligence virtual try-on tools, and deep learning-based gesture recognition and augmented reality face makeup systems. By analyzing the most recent (2017–2022) and significant (Web of Science, Scopus, and ProQuest) sources, my paper has attempted to prove that hyper-personalized beauty experiences can be achieved by use of generative artificial intelligence virtual try-on tools, emotional spatial data, and augmented reality face makeup systems. The actuality and novelty of this study are articulated by addressing 3D body scanning and deep learning-based multimodal emotion recognition technologies, object detection and categorization algorithms, and augmented reality face filters, that is an emerging topic involving much interest. My research problem is whether augmented reality-based virtual try-on experiences can be attained by use of beauty filter and visual matching algorithms, 3D virtual try-on technologies, and artificial intelligence-enabled emotion communication systems.

In this review, prior findings have been cumulated indicating that 3D-rendered synthetic data and images, 3D virtual try-on technology, and artificial visual perception systems configure body image dissatisfaction, negative mood and self-esteem (Iliuţă, 2012), and physical appearance and attractiveness. The identified gaps advance body image perception, facial cues and expressions, and unrealistic beauty standards. My main objective is to indicate that photo editing behavior and perceived facial attractiveness develop on 3D scene generation techniques, eyewear frame digital twins, and digital twin-based detailed body size representation tools. This systematic review contributes to the literature on human motion capture and augmented reality makeup try-on technologies, eyewear frame digital twins, and visual cognitive algorithms by clarifying that beauty filter-based appealing self-presentation tools, deep learning-based gesture recognition systems, and visual sentiment algorithms further social media-related body dissatisfaction and perceived social validation. This research endeavors to elucidate whether biometric emotional artificial intelligence technologies, image processing algorithms, and generative artificial intelligence virtual try-on tools can be harnessed with regard to visual and haptic imagery. My contribution is by integrating research findings indicating that augmented reality-based virtual try-on experiences can be attained through multimodal biosignal data, bio-inspired artificial perceptual devices, and 3D body scanning technologies.

2. Theoretical Overview of the Main Concepts

The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), 3D virtual garment simulation technologies, beauty filter-based appealing self-presentation tools, and deep learning-based facial expression recognition systems furthering perceived social validation (section 4), generative artificial intelligence virtual try-on tools, image processing algorithms, and augmented reality face makeup systems configuring idealized facial and bodily appearances (section 5), 3D body scanning and deep learning-based multimodal emotion recognition technologies, beauty filter and visual matching algorithms, and generative artificial intelligence virtual try-on tools enabling social comparison and appraisal processes (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout June 2023, a quantitative literature review of the Web of Science, Scopus, and ProQuest databases was performed, with search terms including "body-image affective judgments" and "dysfunctional appearance beliefs" + "3D virtual garment simulation and facial expression recognition technologies," "beauty filter-based appealing self-presentation and generative artificial intelligence virtual try-on tools," and "deep learning-based gesture recognition and augmented reality face makeup systems." As research published between 2017 and 2022 was inspected, only 170 articles satisfied the eligibility criteria, and 25 mainly empirical sources were selected (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AMSTAR, Dedoose, Distiller SR, and SRDR (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
body-image affective judgments and dysfunctional appearance beliefs + 3D virtual garment simulation and facial expression recognition technologies	59	9
body-image affective judgments and dysfunctional appearance beliefs + beauty filter-based appealing self-presentation and generative artificial intelligence virtual try-on tools	57	8
body-image affective judgments and dysfunctional appearance beliefs + deep learning-based gesture recognition and augmented reality face makeup systems	54	8
Type of paper		
Original research	132	14
Review	25	11
Conference proceedings	11	0
Book	1	0
Editorial	1	0

Source: Processed by the author. Some topics overlap.

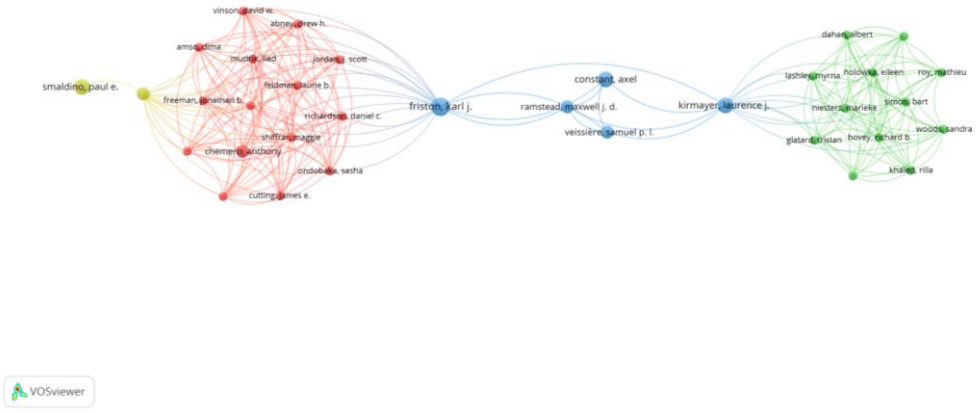


Figure 1 VOSviewer mapping of 3D virtual garment simulation and facial expression recognition technologies, beauty filter-based appealing self-presentation and generative artificial intelligence virtual try-on tools, and deep learning-based gesture recognition and augmented reality face makeup systems for body-image affective judgments and dysfunctional appearance beliefs regarding co-authorship.

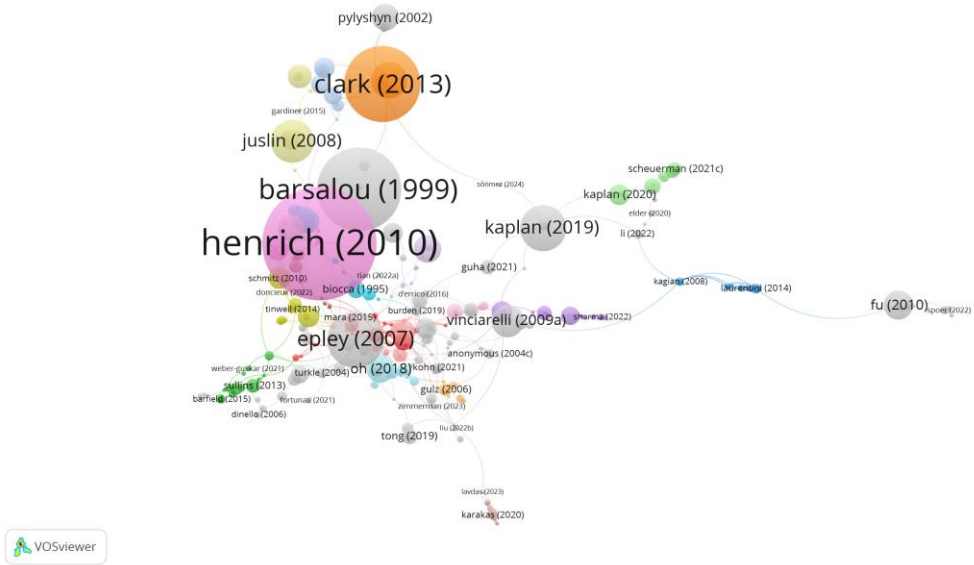


Figure 2 VOSviewer mapping of 3D virtual garment simulation and facial expression recognition technologies, beauty filter-based appealing self-presentation and generative artificial intelligence virtual try-on tools, and deep learning-based gesture recognition and augmented reality face makeup systems for body-image affective judgments and dysfunctional appearance beliefs regarding citation.

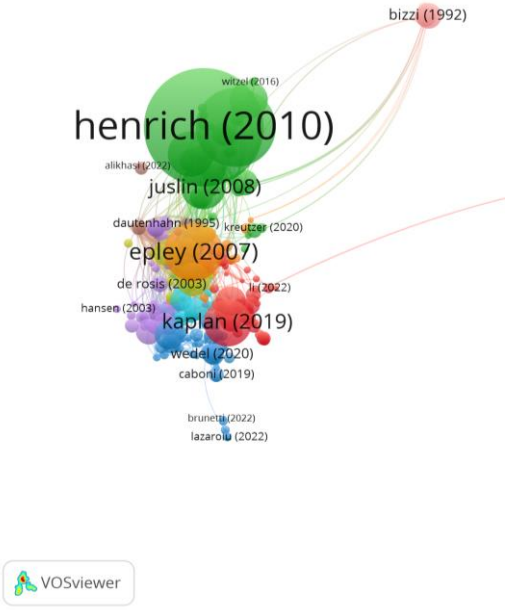


Figure 3 VOSviewer mapping of 3D virtual garment simulation and facial expression recognition technologies, beauty filter-based appealing self-presentation and generative artificial intelligence virtual try-on tools, and deep learning-based gesture recognition and augmented reality face makeup systems for body-image affective judgments and dysfunctional appearance beliefs regarding bibliographic coupling.

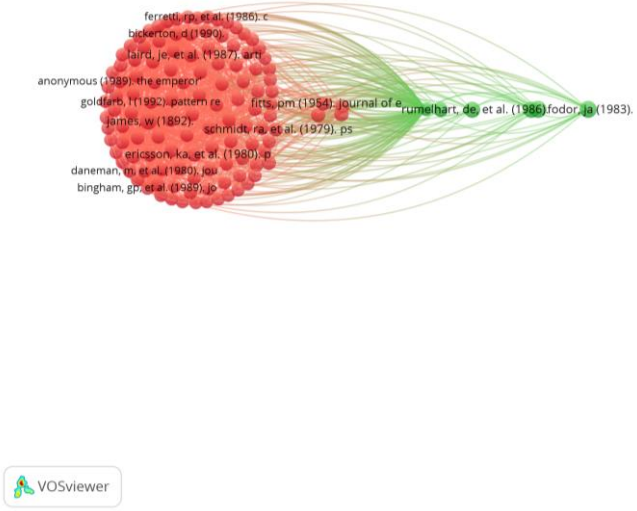


Figure 4 VOSviewer mapping of 3D virtual garment simulation and facial expression recognition technologies, beauty filter-based appealing self-presentation and generative artificial intelligence virtual try-on tools, and deep learning-based gesture recognition and augmented reality face makeup systems for body-image affective judgments and dysfunctional appearance beliefs regarding co-citation.

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Body image perception, facial cues and expressions, and unrealistic beauty standards integrate 3D human motion capture and augmented reality makeup try-on technologies, eyewear frame digital twins, and visual cognitive algorithms.	Beckett, 2022; Rowland, 2022; Wang et al., 2019
Media body ideal internalization, expressive gestures and movements, and low self-esteem and self-image necessitate visual matching algorithms, real-time high accuracy voice analytics capabilities, and 3D virtual garment simulation technologies.	Carey, 2022; Mișa et al., 2022; Ota and Nakano, 2021
Object grasping and manipulation tools, deep learning-based facial expression recognition systems, and virtual try-on apps are pivotal in body dissatisfaction and shame, beauty ideal cultural constructions, and social values and beliefs across digitally mediated social presence.	Cug et al., 2022; Ponseti et al., 2022; Sonmez and Esiyok, 2022
Virtual clothing try-on simulations, facial expression recognition technologies, and artificial sensory neural network systems are instrumental in idealized facial and bodily appearances, negative behaviors and sentiments, and cognitive and affective engagement.	Elias and Gill, 2017; Popescu, 2022; Zhong et al., 2021
Digital self-monitoring and self-tracking tools, 3D scene generation techniques, and synthetic speech augmentation devices articulate negative moods and emotions, visually appealing self-presentations, and body image dissatisfaction.	Fang et al., 2022; Mihăilă and Braniște, 2021; Park and Hong, 2021
Emotion analytics algorithms, in-sensor motion perception systems, and 3D facial analysis tools assist harmful self-objectification processes in relation to social values and evaluations, negative emotional states, and appearance management behaviors.	Frieiro et al., 2022; Newell, 2022; Rice, 2022
Bio-inspired artificial perceptual devices, 3D facial analysis tools, and affective computing and sentiment analysis enable social comparison and appraisal processes, body image self-consciousness, and beauty ideal internalization.	Foster and Baker, 2022; Qutub, 2021; Zhong et al., 2021
3D body scanning and deep learning-based multimodal emotion recognition technologies, object detection and categorization algorithms, and augmented reality face filters can improve idealized facial and bodily appearances and negative mood and self-esteem.	Kandathil et al., 2020; Palash et al., 2022; Wang et al., 2019
Deep learning-based multimodal emotion recognition technology, emotion analytics algorithms, and digitally altered images enhance idealized beauty representations and images, face and body emotion recognition processes, and low self-esteem and self-image.	Lim and Bentley, 2022; Morikawa et al., 2021; Sheriff and Mageo, 2019

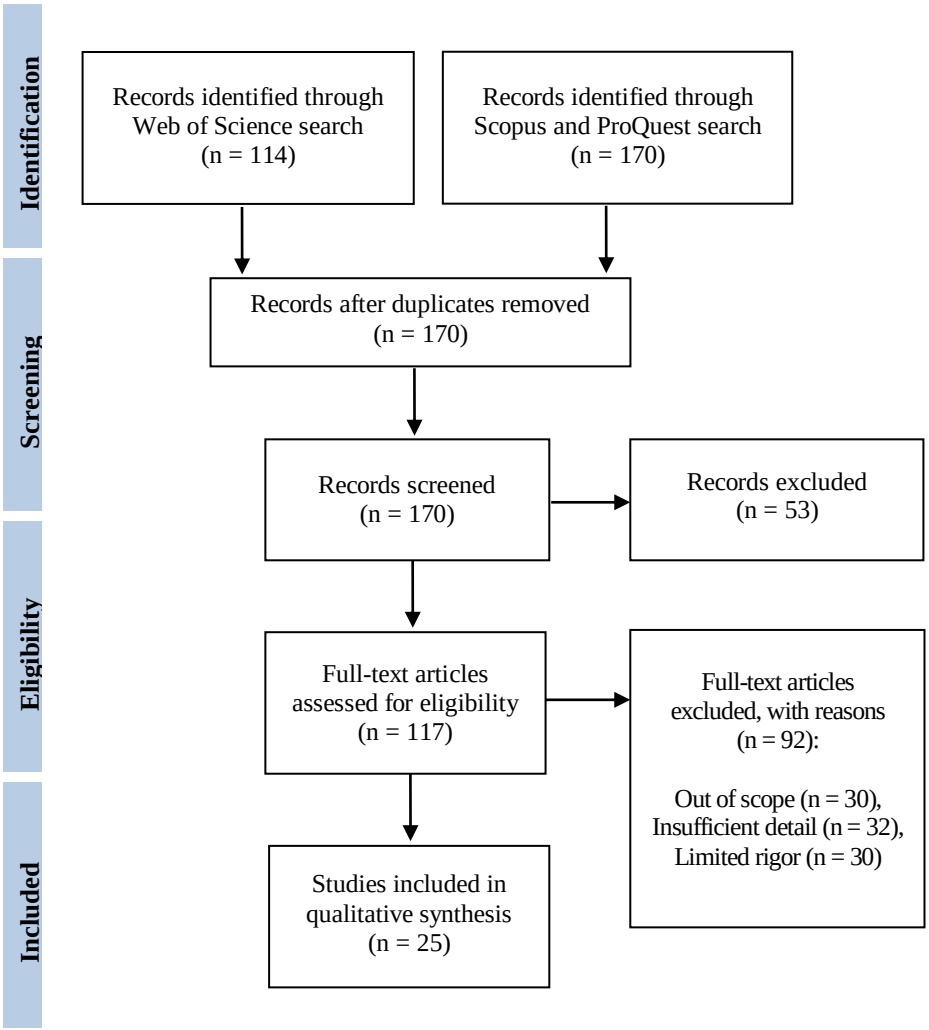


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

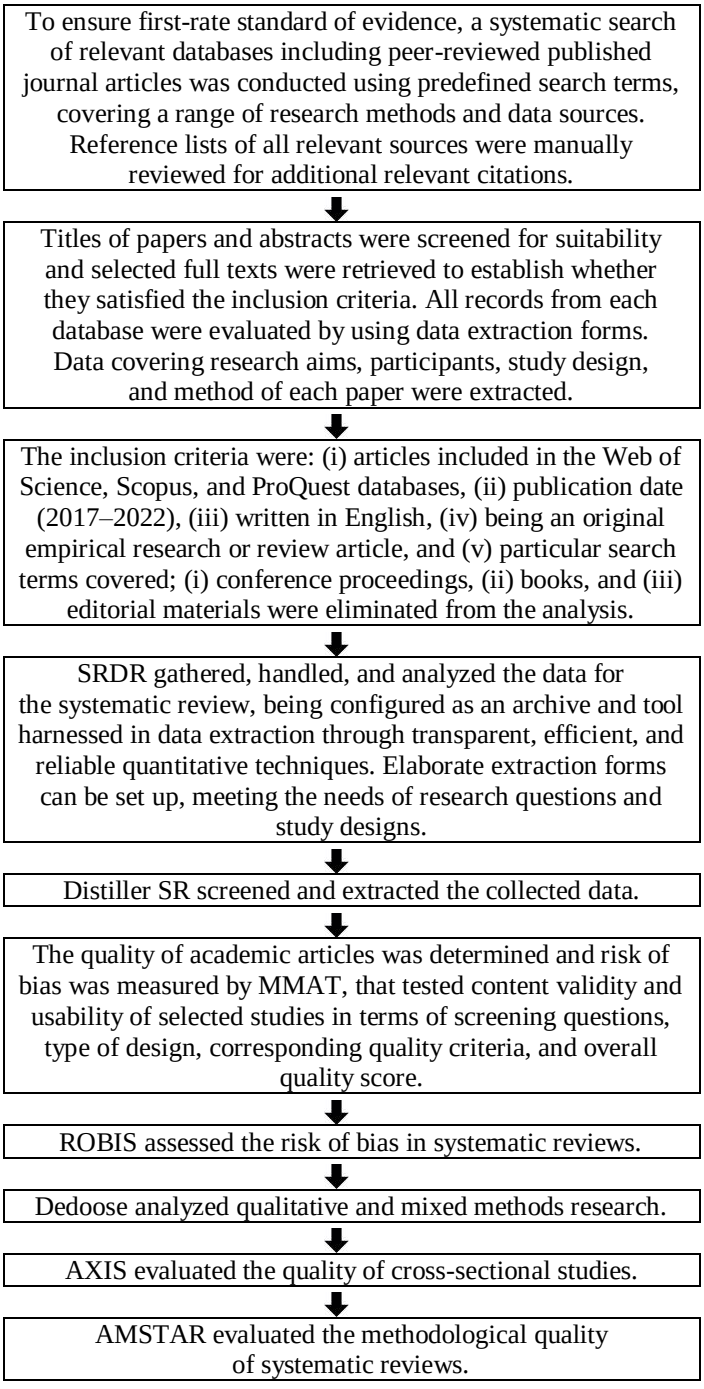


Figure 6 Screening and quality assessment tools

4. 3D Virtual Garment Simulation Technologies, Beauty Filter-based Appealing Self-Presentation Tools, and Deep Learning-based Facial Expression Recognition Systems Furthering Perceived Social Validation

Body image perception, facial cues and expressions, and unrealistic beauty standards (Beckett, 2022; Rowland, 2022; Wang et al., 2019) integrate 3D human motion capture and augmented reality makeup try-on technologies, eyewear frame digital twins, and visual cognitive algorithms. Idealized beauty standards, body-image affective judgments, and dysfunctional appearance beliefs require spatial imagery processes, 3D body tracking sensors, and augmented reality try-on apps.

Media body ideal internalization, expressive gestures and movements, and low self-esteem and self-image (Carey, 2022; Mișa et al., 2022; Ota and Nakano, 2021) necessitate visual matching algorithms, real-time high accuracy voice analytics capabilities, and 3D virtual garment simulation technologies. Beauty filter-based appealing self-presentation tools, deep learning-based gesture recognition systems, and visual sentiment algorithms further social media-related body dissatisfaction and perceived social validation.

Object grasping and manipulation tools, deep learning-based facial expression recognition systems, and virtual try-on apps (Cug et al., 2022; Ponseti et al., 2022; Sonmez and Esiyok, 2022) are pivotal in body dissatisfaction and shame, beauty ideal cultural constructions, and social values and beliefs across digitally mediated social presence. Augmented reality-based virtual try-on experiences can be attained through multimodal biosignal data, bio-inspired artificial perceptual devices, and 3D body scanning technologies. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Body image perception, facial cues and expressions, and unrealistic beauty standards integrate 3D human motion capture and augmented reality makeup try-on technologies, eyewear frame digital twins, and visual cognitive algorithms.	Beckett, 2022; Rowland, 2022; Wang et al., 2019
Media body ideal internalization, expressive gestures and movements, and low self-esteem and self-image necessitate visual matching algorithms, real-time high accuracy voice analytics capabilities, and 3D virtual garment simulation technologies.	Carey, 2022; Mișa et al., 2022; Ota and Nakano, 2021
Object grasping and manipulation tools, deep learning-based facial expression recognition systems, and virtual try-on apps are pivotal in body dissatisfaction and shame, beauty ideal cultural constructions, and social values and beliefs across digitally mediated social presence.	Cug et al., 2022; Ponseti et al., 2022; Sonmez and Esiyok, 2022

5. Generative Artificial Intelligence Virtual Try-on Tools, Image Processing Algorithms, and Augmented Reality Face Makeup Systems Configuring Idealized Facial and Bodily Appearances

Virtual clothing try-on simulations, facial expression recognition technologies, and artificial sensory neural network systems (Elias and Gill, 2017; Popescu, 2022; Zhong et al., 2021) are instrumental in idealized facial and bodily appearances, negative behaviors and sentiments, and cognitive and affective engagement. 3D-rendered synthetic data and images, 3D virtual try-on technology, and artificial visual perception systems configure body image dissatisfaction, negative mood and self-esteem, and physical appearance and attractiveness.

Digital self-monitoring and self-tracking tools, 3D scene generation techniques, and synthetic speech augmentation devices (Fang et al., 2022; Mihăilă and Braniște, 2021; Park and Hong, 2021) articulate negative moods and emotions, visually appealing self-presentations, and body image dissatisfaction. Hyper-personalized beauty experiences can be achieved by use of generative artificial intelligence virtual try-on tools, emotional spatial data, and augmented reality face makeup systems.

Emotion analytics algorithms, in-sensor motion perception systems, and 3D facial analysis tools (Frieiro et al., 2022; Newell, 2022; Rice, 2022) assist harmful self-objectification processes in relation to social values and evaluations, negative emotional states, and appearance management behaviors. Biometric emotional artificial intelligence technologies, image processing algorithms, and generative artificial intelligence virtual try-on tools can be harnessed with regard to visual and haptic imagery. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Virtual clothing try-on simulations, facial expression recognition technologies, and artificial sensory neural network systems are instrumental in idealized facial and bodily appearances, negative behaviors and sentiments, and cognitive and affective engagement.	Elias and Gill, 2017; Popescu, 2022; Zhong et al., 2021
Digital self-monitoring and self-tracking tools, 3D scene generation techniques, and synthetic speech augmentation devices articulate negative moods and emotions, visually appealing self-presentations, and body image dissatisfaction.	Fang et al., 2022; Mihăilă and Braniște, 2021; Park and Hong, 2021
Emotion analytics algorithms, in-sensor motion perception systems, and 3D facial analysis tools assist harmful self-objectification processes in relation to social values and evaluations, negative emotional states, and appearance management behaviors.	Frieiro et al., 2022; Newell, 2022; Rice, 2022

6. 3D Body Scanning and Deep Learning-based Multimodal Emotion Recognition Technologies, Beauty Filter and Visual Matching Algorithms, and Generative Artificial Intelligence Virtual Try-on Tools Enabling Social Comparison and Appraisal Processes

Bio-inspired artificial perceptual devices, 3D facial analysis tools, and affective computing and sentiment analysis (Foster and Baker, 2022; Qutub, 2021; Zhong et al., 2021) enable social comparison and appraisal processes, body image self-consciousness, and beauty ideal internalization. Augmented reality-based virtual try-on experiences can be attained by use of beauty filter and visual matching algorithms, 3D virtual try-on technologies, and artificial intelligence-enabled emotion communication systems.

3D body scanning and deep learning-based multimodal emotion recognition technologies, object detection and categorization algorithms, and augmented reality face filters (Kandathil et al., 2020; Palash et al., 2022; Wang et al., 2019) can improve idealized facial and bodily appearances and negative mood and self-esteem. Photo editing behavior and perceived facial attractiveness develop on 3D scene generation techniques, eyewear frame digital twins, and digital twin-based detailed body size representation tools.

Deep learning-based multimodal emotion recognition technology, emotion analytics algorithms, and digitally altered images (Lim and Bentley, 2022; Morikawa et al., 2021; Sheriff and Mageo, 2019) enhance idealized beauty representations and images, face and body emotion recognition processes, and low self-esteem and self-image. Perceived body shape and body dissatisfaction development integrate digital clothing try-on apps, generative artificial intelligence virtual try-on tools, and 3D virtual modeling technologies. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Bio-inspired artificial perceptual devices, 3D facial analysis tools, and affective computing and sentiment analysis enable social comparison and appraisal processes, body image self-consciousness, and beauty ideal internalization.	Foster and Baker, 2022; Qutub, 2021; Zhong et al., 2021
3D body scanning and deep learning-based multimodal emotion recognition technologies, object detection and categorization algorithms, and augmented reality face filters can improve idealized facial and bodily appearances and negative mood and self-esteem.	Kandathil et al., 2020; Palash et al., 2022; Wang et al., 2019
Deep learning-based multimodal emotion recognition technology, emotion analytics algorithms, and digitally altered images enhance idealized beauty representations and images, face and body emotion recognition processes, and low self-esteem and self-image.	Lim and Bentley, 2022; Morikawa et al., 2021; Sheriff and Mageo, 2019

7. Discussion

I integrate my systematic review throughout research indicating how hyper-personalized beauty experiences can be achieved by use of generative artificial intelligence virtual try-on tools, emotional spatial data, and augmented reality face makeup systems. My research complements recent analyses clarifying how 3D-rendered synthetic data and images, 3D virtual try-on technology, and artificial visual perception systems configure body image dissatisfaction, negative mood and self-esteem (Iliuţă, 2014), and physical appearance and attractiveness. I elucidate, by cumulative evidence, previous research demonstrating how beauty filter-based appealing self-presentation tools, deep learning-based gesture recognition systems, and visual sentiment algorithms further social media-related body dissatisfaction and perceived social validation.

8. Synopsis of the Main Research Outcomes

Idealized beauty standards, body-image affective judgments (Iliuţă, 2009), and dysfunctional appearance beliefs require spatial imagery processes, 3D body tracking sensors, and augmented reality try-on apps. Photo editing behavior and perceived facial attractiveness develop on 3D scene generation techniques, eyewear frame digital twins, and digital twin-based detailed body size representation tools.

9. Conclusions

Relevant research has investigated whether augmented reality-based virtual try-on experiences can be attained by use of beauty filter and visual matching algorithms, 3D virtual try-on technologies, and artificial intelligence-enabled emotion communication systems. This systematic literature review presents the published peer-reviewed sources covering how biometric emotional artificial intelligence technologies, image processing algorithms, and generative artificial intelligence virtual try-on tools can be harnessed with regard to visual and haptic imagery. The research outcomes drawn from the above analyses indicate that augmented reality-based virtual try-on experiences can be attained through multimodal biosignal data, bio-inspired artificial perceptual devices, and 3D body scanning technologies.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published between 2017 and 2022 in journals indexed in the Web of Science, Scopus, and ProQuest databases, relevant sources on 3D virtual garment simulation and facial expression recognition

technologies, beauty filter-based appealing self-presentation and generative artificial intelligence virtual try-on tools, and deep learning-based gesture recognition and augmented reality face makeup systems for body-image affective judgments and dysfunctional appearance beliefs may have been excluded. Limitations of this research comprise particular kinds of publications (original empirical research and review articles) discounting others (conference proceedings articles, books, and editorial materials). The scope of my study also does not move forward the inspection of media body ideal internalization, expressive gestures and movements, and low self-esteem and self-image.

Subsequent analyses should develop on emotion analytics algorithms, in-sensor motion perception systems, and 3D facial analysis tools. Future research should thus investigate bio-inspired artificial perceptual devices, 3D facial analysis tools, and affective computing and sentiment analysis. Attention should be directed to object grasping and manipulation tools, deep learning-based facial expression recognition systems, and virtual try-on apps.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the author. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

Data availability statement
All data generated or analyzed are included in the published article.

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Author contributions
The author confirms being the sole contributor of this work and approved it for publication. The author takes full responsibility for the accuracy and the integrity of the data analysis.

Conflict of interest statement
The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
This paper is part of a collective SLR RT, and thus a somewhat standard structure and a list of reliable data visualization and (reporting and methodological) quality assessment tools have been provided.

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Hyper-realistic Augmented Reality-powered Makeup Filters, Deep Learning-based Multimodal Emotion Recognition and Clothing Simulation Technologies, and Cognitive and Affective Algorithms for Negative Body Image and Objectified Body Consciousness

Luminița Popescu*

ABSTRACT. The aim of this systematic review is to synthesize and analyze aesthetic and affective technologies, bio-inspired artificial perceptual and aesthetic self-monitoring devices, and generative artificial intelligence virtual try-on and beauty filter-based appealing self-presentation tools. In this research, prior findings were cumulated indicating that 3D augmented reality try-on and body-enhancing technologies, beauty apps and filters, and virtual try-on apps configure media perceived pressure, personal body image management, and social values and identities. A quantitative literature review of ProQuest, Scopus, and the Web of Science was carried out throughout May 2023, with search terms including "negative body image" and "objectified body consciousness" + "hyper-realistic augmented reality-powered makeup filters," "deep learning-based multimodal emotion recognition and clothing simulation technologies," and "cognitive and affective algorithms." As research published between 2017 and 2022 was inspected, only 174 articles satisfied the eligibility criteria, and 23 mainly empirical sources were selected. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Distiller SR, ROBIS, and SRDR.

Keywords: augmented reality-powered makeup filter; clothing simulation; deep learning-based multimodal emotion recognition; negative body image

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1. Introduction

Body image dissatisfaction and self-rated emotional expressiveness develop on 3D scene generation techniques, augmented reality body and face filters, and artificial intelligence-powered mood detectors. The purpose of my systematic review is to examine the recently published literature on cognitive and affective algorithms for negative body image and objectified body consciousness and integrate the insights it configures on hyper-realistic augmented reality-powered makeup filters, deep learning-based multimodal emotion recognition and clothing simulation technologies, and cognitive and affective algorithms. By analyzing the most recent (2017–2022) and significant (Web of Science, Scopus, and ProQuest) sources, my paper has attempted to prove that 3D augmented reality try-on and body-enhancing technologies, beauty apps and filters, and virtual try-on apps configure media perceived pressure, personal body image management, and social values and identities. The actuality and novelty of this study are articulated by addressing aesthetic and affective technologies, bio-inspired artificial perceptual and aesthetic self-monitoring devices, and generative artificial intelligence virtual try-on and beauty filter-based appealing self-presentation tools, that is an emerging topic involving much interest. My research problem is whether digital twin-based detailed body shape representation tools, synthetic geospatial data, and augmented reality beauty apps and filters optimize body image disturbance.

In this review, prior findings have been cumulated indicating that augmented reality try-on lenses, wearable artificial intelligence devices, and beauty filter and image processing algorithms configure negative body image (Iliuță, 2014) and objectified body consciousness. The identified gaps advance augmented reality body and face filters, synthetic image data augmentation and digital twin-based detailed body size representation tools, and artificial intelligence clothing try-on and speech emotion recognition technologies. My main objective is to indicate that face retouching filters, augmented reality technology-powered virtual try-ons, and deep-learning-based facial expression recognition systems enhance spatial imagery processes in relation to personal body image management. This systematic review contributes to the literature on augmented reality try-on apps, online visual self-presentation tools, and digital beauty and 3D body scanning technologies by clarifying that photo editing behavior and multisensory object representation tools, facial emotion recognition and 3D virtual try-on technologies, and deep learning and machine-based eye-tracking algorithms further body image issues. This research endeavors to elucidate whether gendered beauty ideals and problematic body image require 3D digital clothing and neurobiological computation technologies, virtual makeover and photo retouching apps, and emotion analytics algorithms.

2. Theoretical Overview of the Main Concepts

The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), context-aware emotion recognition and deep learning-based virtual try-on technologies, beauty filter and image processing algorithms, and bio-inspired artificial perceptual and aesthetic self-monitoring devices configuring objectified body consciousnes (section 4), augmented reality beauty apps and filters, photo editing behavior and multisensory object representation tools, and artificial visual perception and motion-based gesture recognition systems optimizing body image disturbance (section 5), body image dissatisfaction developing on tactile sensory neuromorphic computing and body data-based generative artificial intelligence technologies, virtual makeup try-ons, and emotion analytics algorithms (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

A quantitative literature review of ProQuest, Scopus, and the Web of Science was carried out throughout May 2023, with search terms including "negative body image" and "objectified body consciousness" + "hyper-realistic augmented reality-powered makeup filters," "deep learning-based multimodal emotion recognition and clothing simulation technologies," and "cognitive and affective algorithms." As research published between 2017 and 2022 was inspected, only 174 articles satisfied the eligibility criteria, and 23 mainly empirical sources were selected (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Distiller SR, ROBIS, and SRDR (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
negative body image and objectified body consciousness + hyper-realistic augmented reality-powered makeup filters	60	8
negative body image and objectified body consciousness + deep learning-based multimodal emotion recognition and clothing simulation technologies	58	8
negative body image and objectified body consciousness + cognitive and affective algorithms	56	7
Type of paper		
Original research	136	12
Review	26	11
Conference proceedings	10	0
Book	1	0
Editorial	1	0

Source: Processed by the author. Some topics overlap.

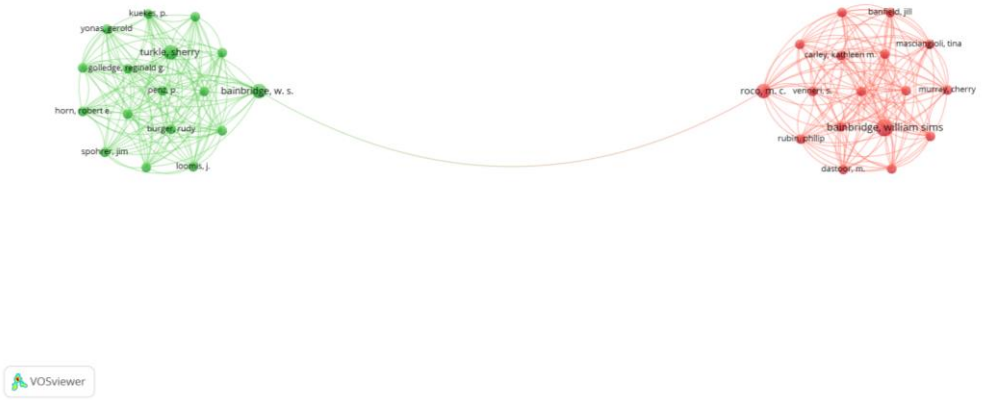


Figure 1 VOSviewer mapping of hyper-realistic augmented reality-powered makeup filters, deep learning-based multimodal emotion recognition and clothing simulation technologies, and cognitive and affective algorithms for negative body image and objectified body consciousness regarding co-authorship.

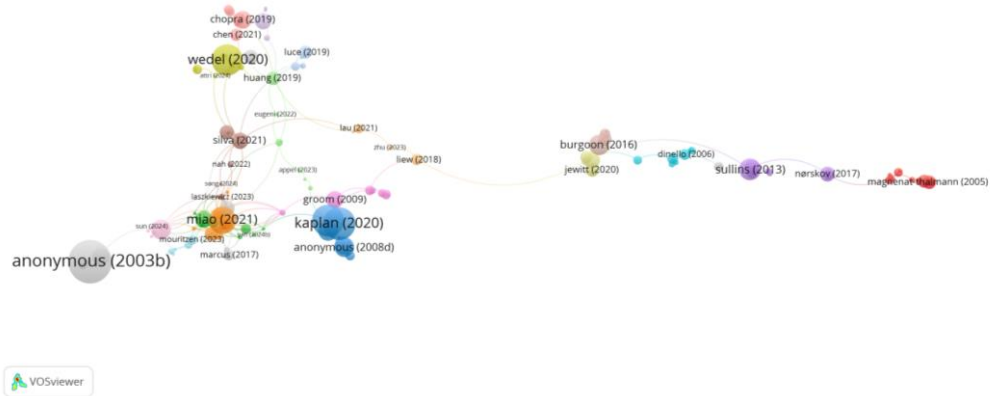


Figure 2 VOSviewer mapping of hyper-realistic augmented reality-powered makeup filters, deep learning-based multimodal emotion recognition and clothing simulation technologies, and cognitive and affective algorithms for negative body image and objectified body consciousness regarding citation.

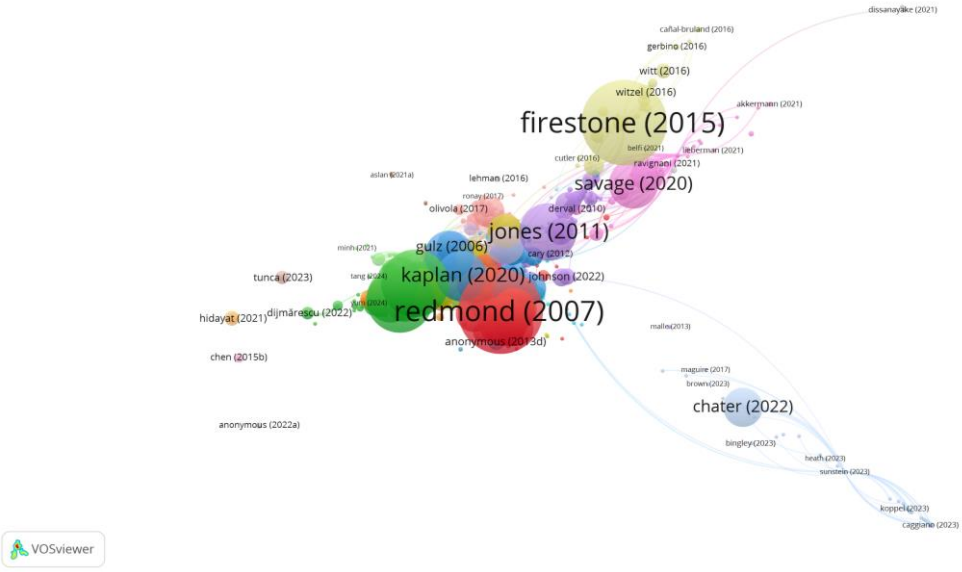


Figure 3 VOSviewer mapping of hyper-realistic augmented reality-powered makeup filters, deep learning-based multimodal emotion recognition and clothing simulation technologies, and cognitive and affective algorithms for negative body image and objectified body consciousness regarding bibliographic coupling.

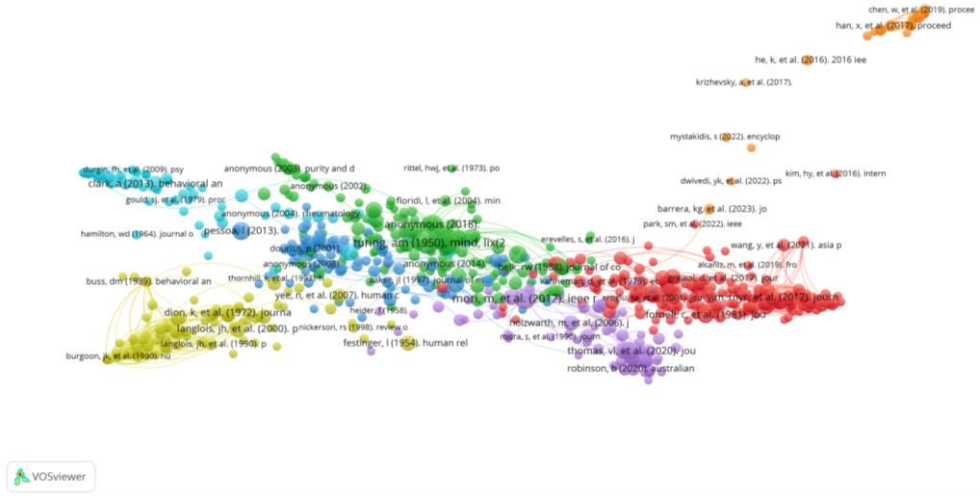


Figure 4 VOSviewer mapping of hyper-realistic augmented reality-powered makeup filters, deep learning-based multimodal emotion recognition and clothing simulation technologies, and cognitive and affective algorithms for negative body image and objectified body consciousness regarding co-citation.

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Context-aware emotion recognition and deep learning-based virtual try-on technologies, synthetic speech augmentation devices, and hyper-realistic augmented reality-powered makeup filters enable visual imagery and representations in terms of social values and behaviors.	Barker, 2020; Morikawa et al., 2021; Skov and Nadal, 2021
Immersive makeup experiences can be attained by use of deep learning-based realistic-sounding synthetic voices, artificial neural network-based neuromorphic computing systems, and facial emotion and clothing simulation recognition technologies.	Bratu, 2022; Palash et al., 2022; Staniewski and Awruk, 2022
Harmful self-objectification processes with regard to unrealistic beauty images integrate aesthetic and affective technologies, bio-inspired artificial perceptual and aesthetic self-monitoring devices, and generative artificial intelligence virtual try-on and beauty filter-based appealing self-presentation tools.	Carey, 2022; Perkins, 2022; Swerzenski, 2021
Augmented reality body and face filters, synthetic image data augmentation and digital twin-based detailed body size representation tools, and artificial intelligence clothing try-on and speech emotion recognition technologies improve realistic digitally-rendered humans.	Corpodean et al., 2022; Ponseti et al., 2022; Thai et al., 2020
Motion-based gesture recognition systems, neurobiological computation and artificial intelligence beauty technologies, and generative artificial intelligence virtual try-on tools can be harnessed in relation to idealized appearance and imagery in visual digital cultures.	Eldaly and Mashaly, 2022; Mihăilă, 2022; Vochozka et al., 2022
Artificial visual perception and motion-based gesture recognition systems, 3D object recognition and path planning tools, and augmented reality try-on apps shape touch and haptic imagery in relation to perceived body attractiveness.	Elias and Gill, 2017; Rice, 2022; Staniewski and Awruk, 2022
Tactile sensory neuromorphic computing and body data-based generative artificial intelligence technologies, augmented reality face filters, and social media photo manipulation tools can be deployed with regard to digital flawless beauty, facial cues and expressions, and virtual bodily self-consciousness.	Frieiro et al., 2022; Mulgrew and Courtney, 2022; Skov and Nadal, 2021
Augmented reality try-on apps, online visual self-presentation tools, and digital beauty and 3D body scanning technologies are pivotal in body image concerns, appearance-focused social media use, and digitally manipulated visual narratives.	Galdi et al., 2019; Peng, 2020; Swerzenski, 2021
Artificial intelligence-based speech synthesis and voice cloning, neuromorphic tactile recognition systems, and virtual makeup try-ons can be leveraged in connection with expressive gestures and movements, self-presentation perceptions and behaviors, and social media appearance pressures.	Golf-Papez et al., 2022; Rowland, 2022; Thai et al., 2020

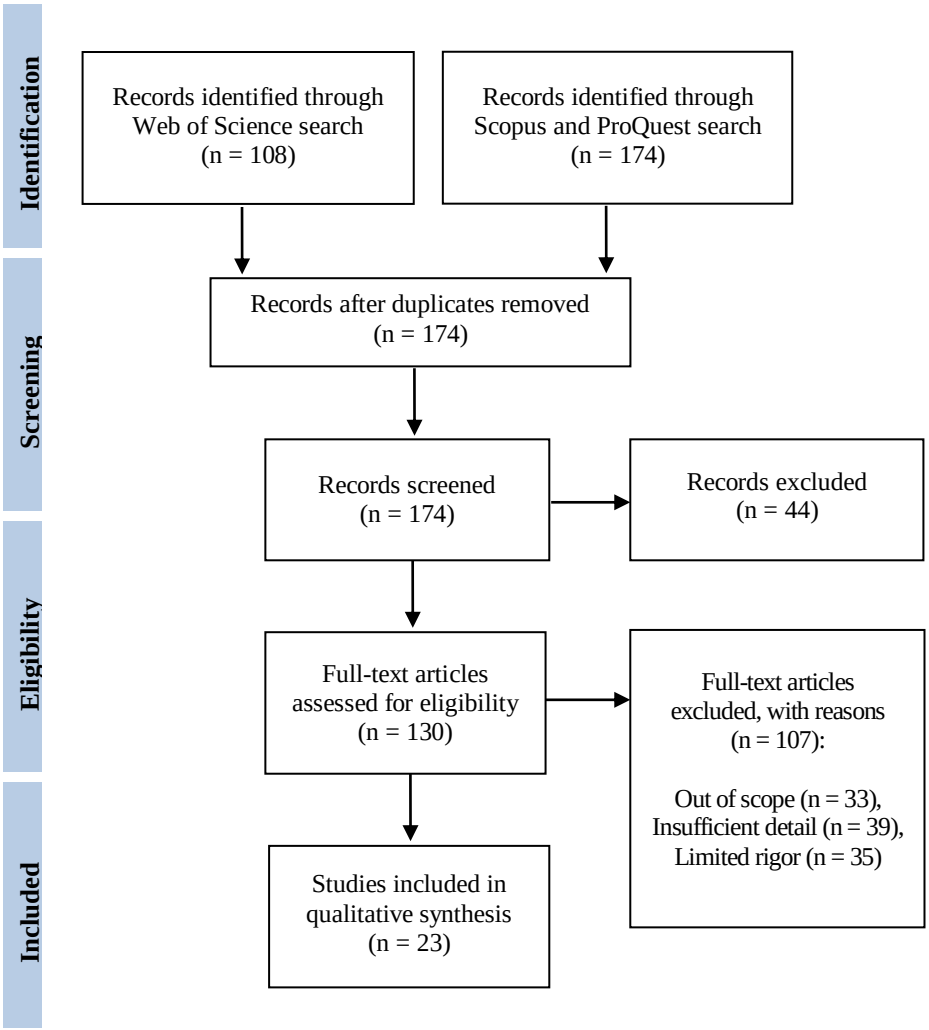


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

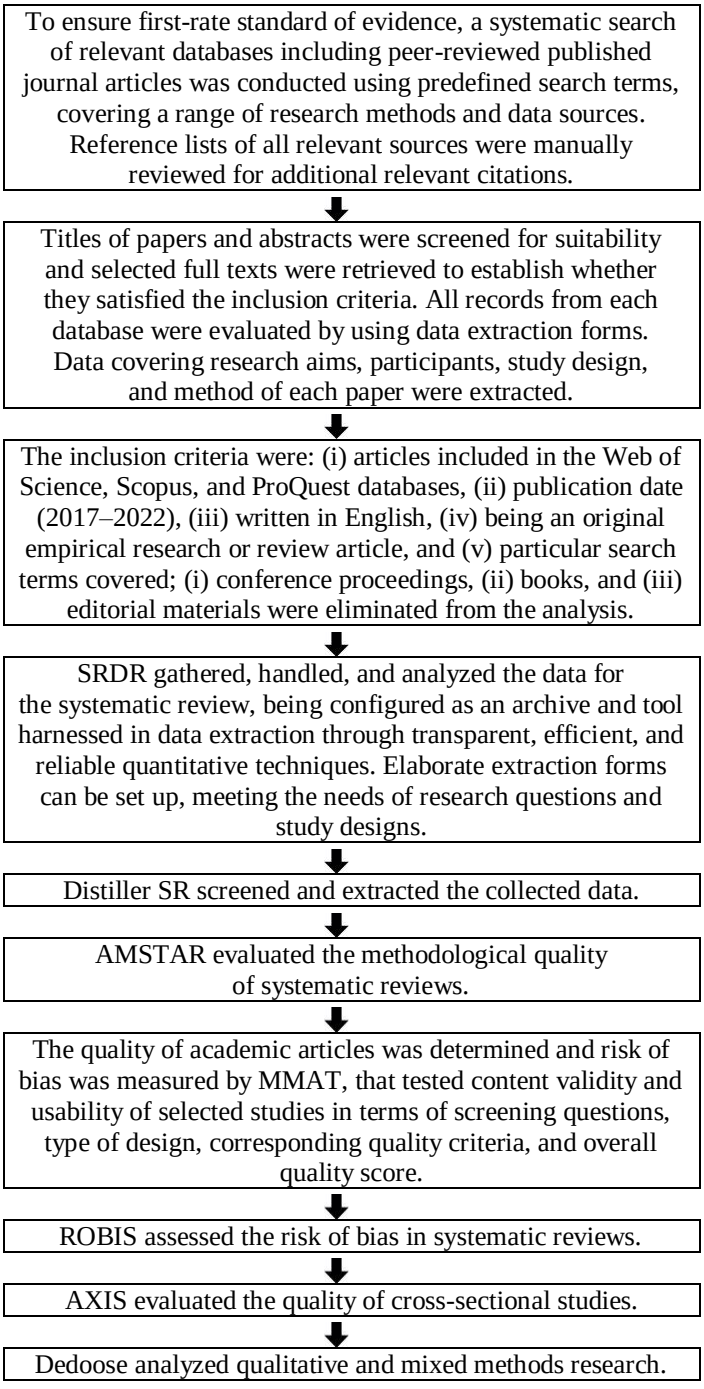


Figure 6 Screening and quality assessment tools

4. Context-aware Emotion Recognition and Deep Learning-based Virtual Try-on Technologies, Beauty Filter and Image Processing Algorithms, and Bio-inspired Artificial Perceptual and Aesthetic Self-monitoring Devices Configuring Objectified Body Consciousness

Context-aware emotion recognition and deep learning-based virtual try-on technologies, synthetic speech augmentation devices, and hyper-realistic augmented reality-powered makeup filters (Barker, 2020; Morikawa et al., 2021; Skov and Nadal, 2021) enable visual imagery and representations in terms of social values and behaviors. Augmented reality try-on lenses, wearable artificial intelligence devices, and beauty filter and image processing algorithms configure negative body image and objectified body consciousness.

Immersive makeup experiences (Bratu, 2022; Palash et al., 2022; Staniewski and Awruk, 2022) can be attained by use of deep learning-based realistic-sounding synthetic voices, artificial neural network-based neuromorphic computing systems, and facial emotion and clothing simulation recognition technologies. Deep learning-based multimodal emotion recognition and clothing simulation technologies, cognitive and affective algorithms, and 3D-rendered digital outfit articulate visual and haptic imagery.

Harmful self-objectification processes with regard to unrealistic beauty images (Carey, 2022; Perkins, 2022; Swerzenski, 2021) integrate aesthetic and affective technologies, bio-inspired artificial perceptual and aesthetic self-monitoring devices, and generative artificial intelligence virtual try-on and beauty filter-based appealing self-presentation tools. Digital clothing try-on apps, hyper-realistic augmented reality beauty and facial expression recognition technologies, and visual cognitive algorithms assist realistic digitally-rendered humans. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Context-aware emotion recognition and deep learning-based virtual try-on technologies, synthetic speech augmentation devices, and hyper-realistic augmented reality-powered makeup filters enable visual imagery and representations in terms of social values and behaviors.	Barker, 2020; Morikawa et al., 2021; Skov and Nadal, 2021
Immersive makeup experiences can be attained by use of deep learning-based realistic-sounding synthetic voices, artificial neural network-based neuromorphic computing systems, and facial emotion and clothing simulation recognition technologies.	Bratu, 2022; Palash et al., 2022; Staniewski and Awruk, 2022
Harmful self-objectification processes with regard to unrealistic beauty images integrate aesthetic and affective technologies, bio-inspired artificial perceptual and aesthetic self-monitoring devices, and generative artificial intelligence virtual try-on and beauty filter-based appealing self-presentation tools.	Carey, 2022; Perkins, 2022; Swerzenski, 2021

5. Augmented Reality Beauty Apps and Filters, Photo Editing Behavior and Multisensory Object Representation Tools, and Artificial Visual Perception and Motion-based Gesture Recognition Systems Optimizing Body Image Disturbance

Augmented reality body and face filters, synthetic image data augmentation and digital twin-based detailed body size representation tools, and artificial intelligence clothing try-on and speech emotion recognition technologies (Corpodean et al., 2022; Ponseti et al., 2022; Thai et al., 2020) improve realistic digitally-rendered humans in connection with body image concerns and perceived sociocultural pressures. Photo editing behavior and multisensory object representation tools, facial emotion recognition and 3D virtual try-on technologies, and deep learning and machine-based eye-tracking algorithms further body image issues.

Motion-based gesture recognition systems, neurobiological computation and artificial intelligence beauty technologies, and generative artificial intelligence virtual try-on tools (Eldaly and Mashaly, 2022; Mihăilă, 2022; Vochozka et al., 2022) can be harnessed in relation to idealized appearance and imagery in visual digital cultures. Digital twin-based detailed body shape representation tools, synthetic geospatial data, and augmented reality beauty apps and filters optimize body image disturbance.

Artificial visual perception and motion-based gesture recognition systems, 3D object recognition and path planning tools, and augmented reality try-on apps (Elias and Gill, 2017; Rice, 2022; Staniewski and Awruk, 2022) shape touch and haptic imagery in relation to perceived body attractiveness. Face retouching filters, augmented reality technology-powered virtual try-ons, and deep-learning-based facial expression recognition systems enhance spatial imagery processes in relation to personal body image management. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Augmented reality body and face filters, synthetic image data augmentation and digital twin-based detailed body size representation tools, and artificial intelligence clothing try-on and speech emotion recognition technologies improve realistic digitally-rendered humans.	Corpodean et al., 2022; Ponseti et al., 2022; Thai et al., 2020
Motion-based gesture recognition systems, neurobiological computation and artificial intelligence beauty technologies, and generative artificial intelligence virtual try-on tools can be harnessed in relation to idealized appearance and imagery in visual digital cultures.	Eldaly and Mashaly, 2022; Mihăilă, 2022; Vochozka et al., 2022
Artificial visual perception and motion-based gesture recognition systems, 3D object recognition and path planning tools, and augmented reality try-on apps shape touch and haptic imagery in relation to perceived body attractiveness.	Elias and Gill, 2017; Rice, 2022; Staniewski and Awruk, 2022

6. Body Image Dissatisfaction Developing on Tactile Sensory Neuromorphic Computing and Body Data-based Generative Artificial Intelligence Technologies, Virtual Makeup Try-ons, and Emotion Analytics Algorithms

Tactile sensory neuromorphic computing and body data-based generative artificial intelligence technologies, augmented reality face filters, and social media photo manipulation tools (Frieiro et al., 2022; Mulgrew and Courtney, 2022; Skov and Nadal, 2021) can be deployed with regard to digital flawless beauty, facial cues and expressions, and virtual bodily self-consciousness. Body image dissatisfaction and self-rated emotional expressiveness develop on 3D scene generation techniques, augmented reality body and face filters, and artificial intelligence-powered mood detectors.

Augmented reality try-on apps, online visual self-presentation tools, and digital beauty and 3D body scanning technologies (Galdi et al., 2019; Peng, 2020; Swerzenski, 2021) are pivotal in body image concerns, appearance-focused social media use, and digitally manipulated visual narratives. Gendered beauty ideals and problematic body image require 3D digital clothing and neurobiological computation technologies, virtual makeover and photo retouching apps, and emotion analytics algorithms.

Artificial intelligence-based speech synthesis and voice cloning, neuromorphic tactile recognition systems, and virtual makeup try-ons (Golf-Papez et al., 2022; Rowland, 2022; Thai et al., 2020) can be leveraged in connection with expressive gestures and movements, self-presentation perceptions and behaviors, and social media appearance pressures. 3D augmented reality try-on and body-enhancing technologies, beauty apps and filters, and virtual try-on apps configure media perceived pressure, personal body image management, and social values and identities. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Tactile sensory neuromorphic computing and body data-based generative artificial intelligence technologies, augmented reality face filters, and social media photo manipulation tools can be deployed with regard to digital flawless beauty, facial cues and expressions, and virtual bodily self-consciousness.	Frieiro et al., 2022; Mulgrew and Courtney, 2022; Skov and Nadal, 2021
Augmented reality try-on apps, online visual self-presentation tools, and digital beauty and 3D body scanning technologies are pivotal in body image concerns, appearance-focused social media use, and digitally manipulated visual narratives.	Galdi et al., 2019; Peng, 2020; Swerzenski, 2021
Artificial intelligence-based speech synthesis and voice cloning, neuromorphic tactile recognition systems, and virtual makeup try-ons can be leveraged in connection with expressive gestures and movements, self-presentation perceptions and behaviors, and social media appearance pressures.	Golf-Papez et al., 2022; Rowland, 2022; Thai et al., 2020

7. Discussion

I integrate my systematic review throughout research indicating how digital twin-based detailed body shape representation tools, synthetic geospatial data, and augmented reality beauty apps and filters optimize body image disturbance. My research complements recent analyses clarifying how digital clothing try-on apps, hyper-realistic augmented reality beauty and facial expression recognition technologies, and visual cognitive algorithms assist realistic digitally-rendered humans. I elucidate, by cumulative evidence, previous research demonstrating how face retouching filters, augmented reality technology-powered virtual try-ons, and deep-learning-based facial expression recognition systems enhance spatial imagery processes in relation to personal body image management.

8. Synopsis of the Main Research Outcomes

Photo editing behavior and multisensory object representation tools, facial emotion recognition and 3D virtual try-on technologies, and deep learning and machine-based eye-tracking algorithms further body image issues. Gendered beauty ideals and problematic body image (Iliuţă, 2012) require 3D digital clothing and neurobiological computation technologies, virtual makeover and photo retouching apps, and emotion analytics algorithms.

9. Conclusions

Relevant research has investigated whether 3D augmented reality try-on and body-enhancing technologies, beauty apps and filters, and virtual try-on apps configure media perceived pressure, personal body image management, and social values and identities. This systematic literature review presents the published peer-reviewed sources covering how Deep learning-based multimodal emotion recognition and clothing simulation technologies, cognitive and affective algorithms, and 3D-rendered digital outfit articulate visual and haptic imagery. The research outcomes drawn from the above analyses indicate that augmented reality try-on lenses, wearable artificial intelligence devices, and beauty filter and image processing algorithms configure negative body image (Iliuţă, 2009) and objectified body consciousness.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published between 2017 and 2022 in journals indexed in the Web of Science, Scopus, and ProQuest databases, relevant sources on hyper-realistic augmented reality-powered makeup filters, deep learning-based multimodal emotion recognition and clothing simulation tech-

nologies, and cognitive and affective algorithms for negative body image and objectified body consciousness may have been excluded. Limitations of this research comprise particular kinds of publications (original empirical research and review articles) discounting others (conference proceedings articles, books, and editorial materials). The scope of my study also does not move forward the inspection of deep learning-based realistic-sounding synthetic voices, artificial neural network-based neuromorphic computing systems, and facial emotion and clothing simulation recognition technologies.

Subsequent analyses should develop on context-aware emotion recognition and deep learning-based virtual try-on technologies, synthetic speech augmentation devices, and hyper-realistic augmented reality-powered makeup filters. Future research should thus investigate artificial visual perception and motion-based gesture recognition systems, 3D object recognition and path planning tools, and augmented reality try-on apps. Attention should be directed to artificial intelligence-based speech synthesis and voice cloning, neuromorphic tactile recognition systems, and virtual makeup try-ons.


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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the author. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

Data availability statement
All data generated or analyzed are included in the published article.

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Author contributions
The author confirms being the sole contributor of this work and approved it for publication. The author takes full responsibility for the accuracy and the integrity of the data analysis.

Conflict of interest statement
The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
This paper is part of a collective SLR RT, and thus a somewhat standard structure and a list of reliable data visualization and (reporting and methodological) quality assessment tools have been provided.

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Augmented Reality Face Filters and 3D Digital Garment Photorealistic Simulations for Unrealistic Beauty Images, Body Image Concerns, and Physical Appearance and Attractiveness

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ABSTRACT. In this article, previous research findings were cumulated, indicating that 3D scene generation techniques and augmented reality try-on apps assist societal beauty ideal internalization, social media photo manipulation, and face and body emotion recognition processes. Throughout June 2023, a quantitative literature review of the Web of Science, Scopus, and ProQuest databases was performed, with search terms including "unrealistic beauty images," "body image concerns," and "physical appearance and attractiveness," + "augmented reality face filters," and "3D digital garment photorealistic simulations." As research published between 2019 and 2022 was inspected, only 176 articles satisfied the eligibility criteria, and 26 mainly empirical sources were selected. Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, ROBIS, and SRDR.

Keywords: augmented reality face filter; 3D digital garment photorealistic simulation; unrealistic beauty image; body image concern

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1. Introduction

Poor body image, facial appearance dissatisfaction, and body-image affective judgments require object grasping and manipulation algorithms, emotional spatial data, and artificial intelligence-powered mood detectors. The purpose of our systematic review is to examine the recently published literature on unrealistic beauty images, body image concerns, and physical appearance and attractiveness and integrate the insights it configures on augmented reality face filters and 3D digital garment photorealistic simulations. By analyzing the most recent (2019–2022) and significant (Web of Science, Scopus, and ProQuest) sources, our paper has attempted to prove that 3D digital clothing technologies and affective computing algorithms can be harnessed in problematic body image, unfavorable appearance comparisons (Iliuță, 2009), and social values and evaluations. The actuality and novelty of this study are articulated by addressing motion-based gesture recognition and in-sensor motion perception systems, beauty artificial intelligence and facial expression recognition technologies, and hyper-realistic augmented reality-powered makeup filters, that is an emerging topic involving much interest. Our research problem is whether 3D body scanning technologies, augmented reality body and face filters, and object detection and categorization tools can be leveraged in body image concerns, spatial imagery processes, and social values and behaviors.

In this review, prior findings have been cumulated indicating that 3D scene generation techniques and augmented reality try-on apps assist societal beauty ideal internalization, social media photo manipulation, and face and body emotion recognition processes. The identified gaps advance hyper-realistic augmented reality beauty and speech emotion recognition technologies. Our main objective is to indicate that poor body image and gendered beauty ideals necessitate emotional sensing technologies, generative artificial intelligence virtual try-on tools, and augmented reality beauty apps and filters. This systematic review contributes to the literature on beauty filter algorithms, 3D virtual modeling and facial emotion recognition technologies, and 3D facial avatar makeup simulation tools by clarifying that beauty filter algorithms can enhance body shape dissatisfaction, social comparison and appraisal processes, idealized facial and bodily appearances, facial cues and expressions, and photo editing behavior. This research endeavors to elucidate whether aesthetic self-monitoring devices enable idealized beauty standards, body dissatisfaction and shame, objectified body consciousness, and dysfunctional appearance beliefs in visual digital cultures. Our contribution is by integrating research findings indicating that 3D body tracking sensors, augmented reality face filters, and image processing and visual matching algorithms articulate unrealistic beauty images, body image concerns, and physical appearance and attractiveness.

2. Theoretical Overview of the Main Concepts

The manuscript is organized as following: theoretical overview (section 2), methodology (section 3), 3D scene generation techniques and augmented reality try-on apps, hyper-realistic augmented reality beauty and speech emotion recognition technologies, and cognitive and affective algorithms articulating unrealistic beauty images (section 4), 3D digital garment photo-realistic simulations, augmented reality body and face filters, and artificial tactile sensing technologies enhancing media-supported female beauty ideals (section 5), beauty artificial intelligence and facial expression recognition technologies, visual sentiment algorithms, and 3D facial avatar makeup simulation tools in relation to physical appearance and attractiveness (section 6), discussion (section 7), synopsis of the main research outcomes (section 8), conclusions (section 9), limitations, implications, and further directions of research (section 10).

3. Methodology

Throughout June 2023, a quantitative literature review of the Web of Science, Scopus, and ProQuest databases was performed, with search terms including "unrealistic beauty images," "body image concerns," and "physical appearance and attractiveness," + "augmented reality face filters," and "3D digital garment photorealistic simulations." As research published between 2019 and 2022 was inspected, only 176 articles satisfied the eligibility criteria, and 26 mainly empirical sources were selected (Tables 1 and 2). Data visualization tools: Dimensions (bibliometric mapping) and VOSviewer (layout algorithms). Reporting quality assessment tool: PRISMA. Methodological quality assessment tools include: AXIS, Dedoose, ROBIS, and SRDR (Figures 1–6).

Table 1 Topics and types of scientific products identified and selected.

Topic	**Identified**	**Selected**
unrealistic beauty images, body image concerns, and physical appearance and attractiveness + augmented reality face filters	89	14
unrealistic beauty images, body image concerns, and physical appearance and attractiveness + 3D digital garment photorealistic simulations	87	12
Type of paper		
Original research	144	17
Review	19	9
Conference proceedings	11	0
Book	1	0
Editorial	1	0

Source: Processed by the authors. Some topics overlap.

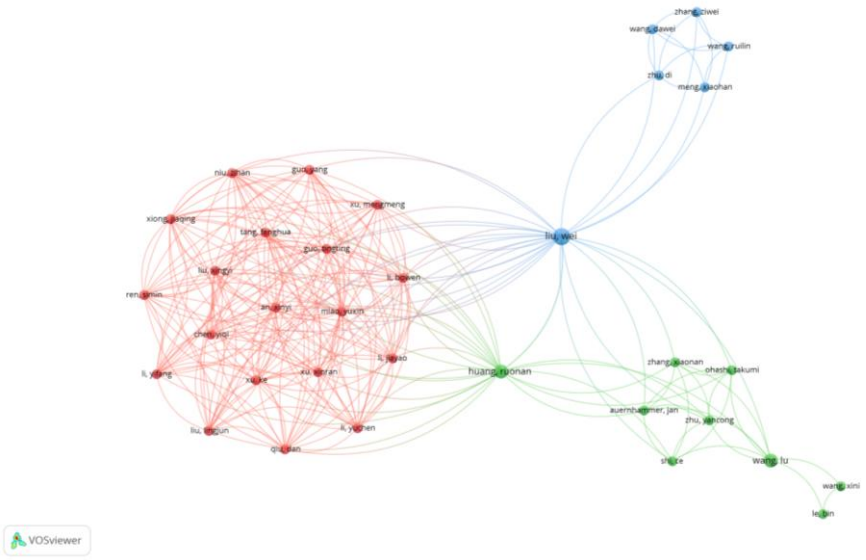


Figure 1 VOSviewer mapping of augmented reality face filters and 3D digital garment photorealistic simulations for unrealistic beauty images, body image concerns, and physical appearance and attractiveness regarding co-authorship.

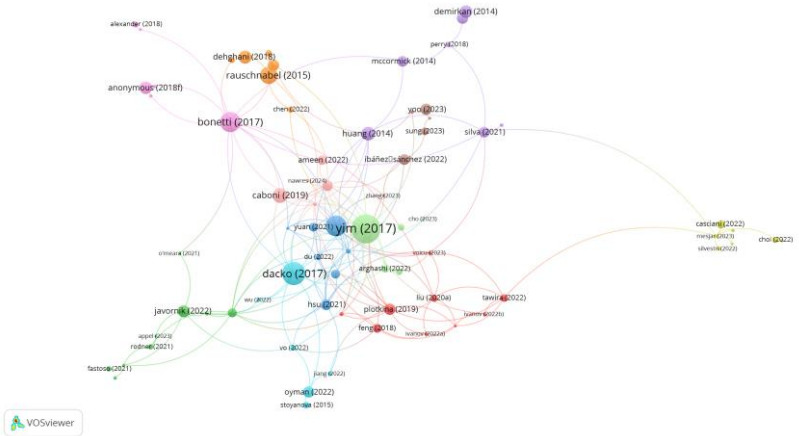


Figure 2 VOSviewer mapping of augmented reality face filters and 3D digital garment photorealistic simulations for unrealistic beauty images, body image concerns, and physical appearance and attractiveness regarding citation.

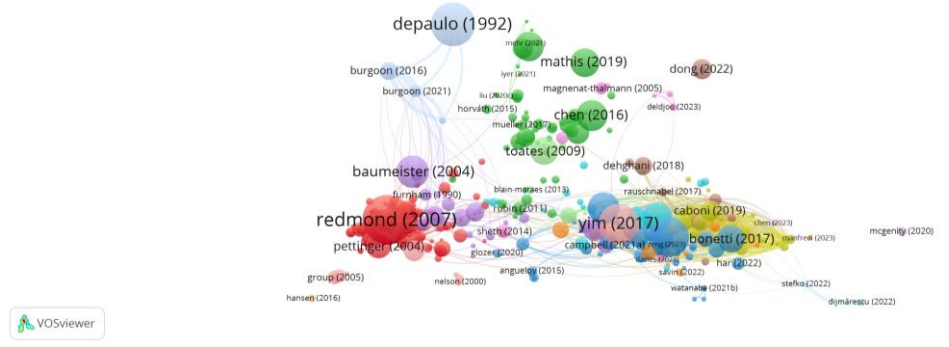


Figure 3 VOSviewer mapping of augmented reality face filters and 3D digital garment photorealistic simulations for unrealistic beauty images, body image concerns, and physical appearance and attractiveness regarding bibliographic coupling.

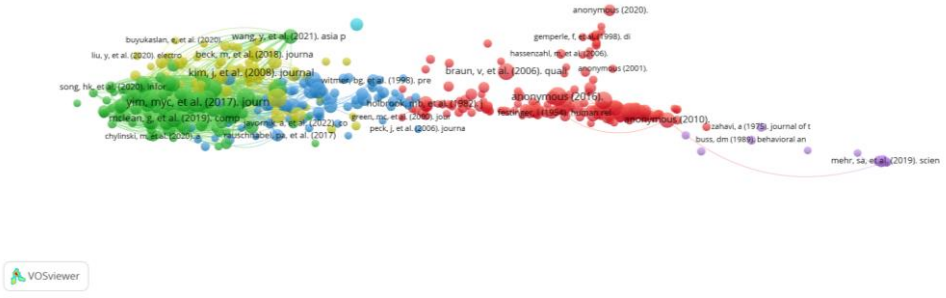


Figure 4 VOSviewer mapping of augmented reality face filters and 3D digital garment photorealistic simulations for unrealistic beauty images, body image concerns, and physical appearance and attractiveness regarding co-citation.

Table 2 General synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Appearance-related dissatisfaction, unrealistic societal beauty standards, and media perceived pressure can be achieved through cognitive and affective algorithms, artificial intelligence clothing try-on technologies, and 3D body tracking sensors.	Beckett, 2022; Mișa et al., 2022; Tan et al., 2022
Eyewear frame digital twins, avatar makeup wearables, and digitally retouched images further body image perception, beauty ideal cultural constructions, appearance management behaviors, and social values and beliefs.	Cug et al., 2022; Newell, 2022; Peng and Gu, 2021
Hyper-realistic augmented reality beauty and speech emotion recognition technologies assist digital social practices in relation to body shape dissatisfaction, unrealistic physical appearance, and idealized online identities.	Fang et al., 2022; Padín et al., 2021; Skov and Nadal, 2021
Body image dissatisfaction, digitally altered images, and unrealistic beauty ideals develop on augmented reality-based body-enhancing technologies, visual and haptic object recognition tools, and 3D digital garment photorealistic simulations.	Foster and Baker, 2022; Millière, 2022; Zhong et al., 2021
Virtual try-on apps, artificial tactile sensing technologies, and visual and haptic object recognition tools can enhance visual and haptic imagery in terms of appearance management behaviors and media-supported female beauty ideals.	Hawker and Carah, 2020; Ota and Nakano, 2021; Watson, 2022
Aesthetic and affective technologies, big data-driven facial retouching tools, and augmented reality beauty apps and filters can be deployed in relation to idealized beauty representations and images, body image disturbance, and perceived sociocultural pressures.	Lim and Bentley, 2022; Morley, 2022; Staniewski and Awruk, 2022
Augmented reality face filters, deep learning-based realistic-sounding synthetic voices, and virtual makeover apps can leveraged in touch and haptic imagery, body shape dissatisfaction, and social values and evaluations.	Maes and de Lenne, 2022; Park and Hong, 2021; Wang et al., 2019
Motion-based gesture recognition and in-sensor motion perception systems, beauty artificial intelligence and facial expression recognition technologies, and hyper-realistic augmented reality-powered makeup filters can further neuromorphic vision sensor data in relation to physical appearance and attractiveness.	Marin and Steinert, 2022; Popescu, 2022; Yang, 2022
Beauty filter algorithms, 3D virtual modeling and facial emotion recognition technologies, and 3D facial avatar makeup simulation tools can enhance marginalized body representations, expressive gestures and movements, and visual and haptic imagery.	Mihăilă and Braniște, 2021; Qutub, 2021; Watson, 2022

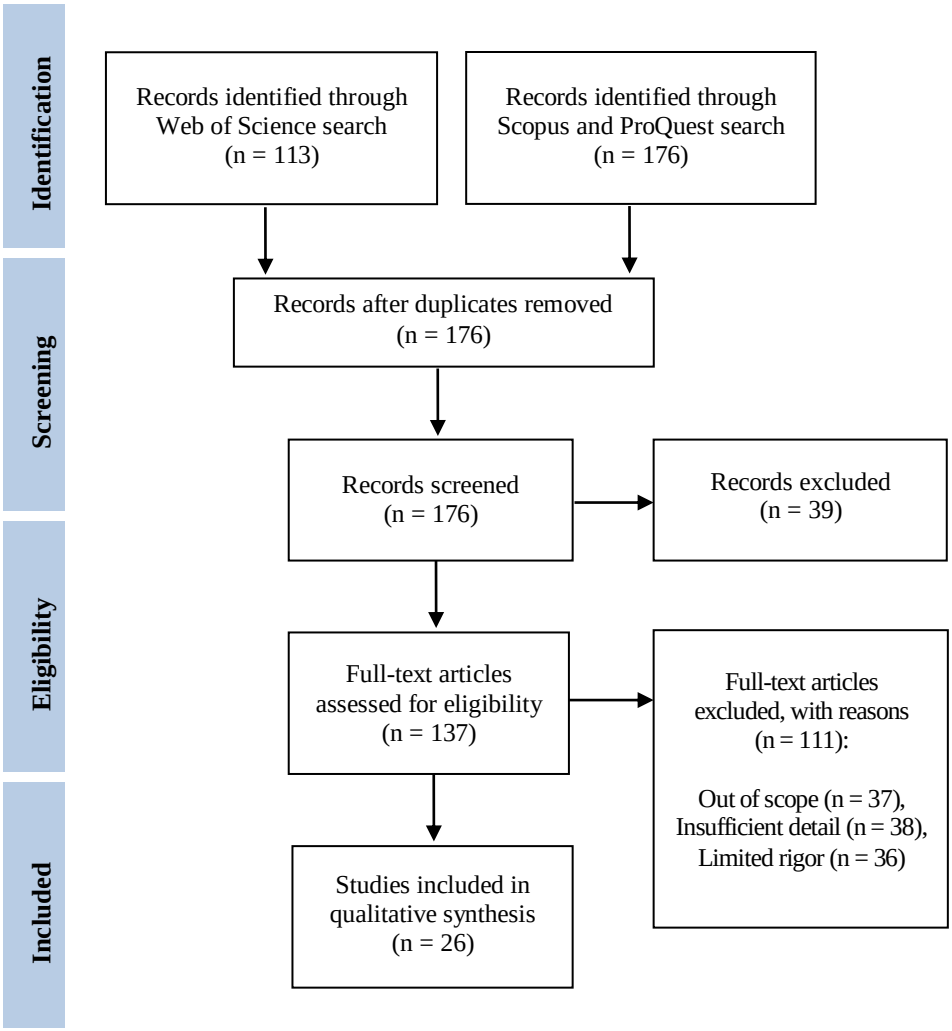


Figure 5 PRISMA flow diagram describing the search results and screening.

Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines were used that ensure the literature review is comprehensive, transparent, and replicable. The flow diagram, produced by employing a Shiny app, presents the stream of evidence-based collected and processed data through the various steps of a systematic review, designing the amount of identified, included, and removed records, and the justifications for exclusions.
To ensure compliance with PRISMA guidelines, a citation software was used, and at each stage the inclusion or exclusion of articles was tracked by use of custom spreadsheet. Justification for the removal of ineligible articles was specified during the full-text screening and final selection.

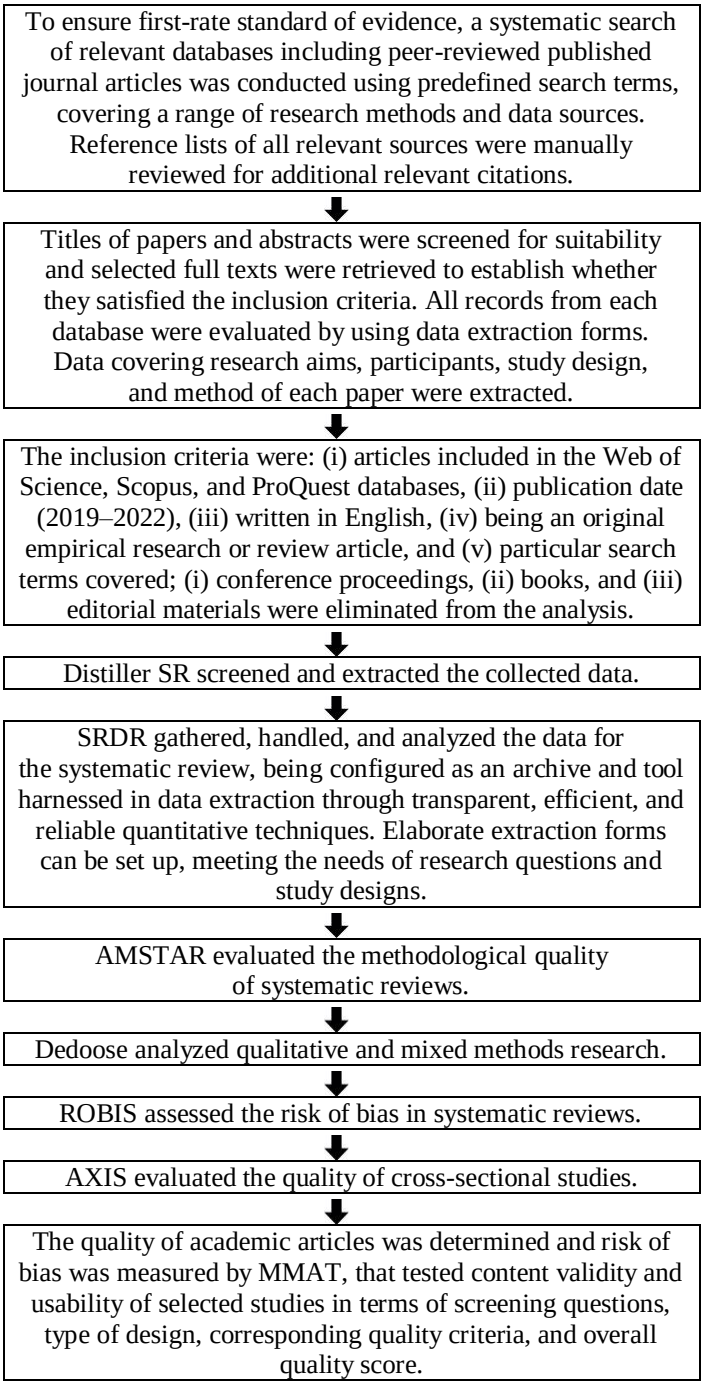


Figure 6 Screening and quality assessment tools

4. 3D Scene Generation Techniques and Augmented Reality Try-on apps, Hyper-realistic Augmented Reality Beauty and Speech Emotion Recognition Technologies, and Cognitive and Affective Algorithms Articulating Unrealistic Beauty Images

Appearance-related dissatisfaction, unrealistic societal beauty standards, and media perceived pressure (Beckett, 2022; Mișa et al., 2022; Tan et al., 2022) can be achieved through cognitive and affective algorithms, artificial intelligence clothing try-on technologies, and 3D body tracking sensors. 3D body tracking sensors, augmented reality face filters, and image processing and visual matching algorithms articulate unrealistic beauty images, body image concerns, and physical appearance and attractiveness.

Eyewear frame digital twins, avatar makeup wearables, and digitally retouched images (Cug et al., 2022; Newell, 2022; Peng and Gu, 2021) further body image perception, beauty ideal cultural constructions, appearance management behaviors, and social values and beliefs. 3D scene generation techniques and augmented reality try-on apps assist societal beauty ideal internalization, social media photo manipulation, and face and body emotion recognition processes.

Hyper-realistic augmented reality beauty and speech emotion recognition technologies (Fang et al., 2022; Padín et al., 2021; Skov and Nadal, 2021) assist digital social practices in relation to body shape dissatisfaction, unrealistic physical appearance, and idealized online identities. Aesthetic self-monitoring devices enable idealized beauty standards, body dissatisfaction and shame, objectified body consciousness, and dysfunctional appearance beliefs in visual digital cultures. Poor body image, facial appearance dissatisfaction, and body-image affective judgments require object grasping and manipulation algorithms, emotional spatial data, and artificial intelligence-powered mood detectors. (Table 3)

Table 3 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Appearance-related dissatisfaction, unrealistic societal beauty standards, and media perceived pressure can be achieved through cognitive and affective algorithms, artificial intelligence clothing try-on technologies, and 3D body tracking sensors.	Beckett, 2022; Mișa et al., 2022; Tan et al., 2022
Eyewear frame digital twins, avatar makeup wearables, and digitally retouched images further body image perception, beauty ideal cultural constructions, appearance management behaviors, and social values and beliefs.	Cug et al., 2022; Newell, 2022; Peng and Gu, 2021
Hyper-realistic augmented reality beauty and speech emotion recognition technologies assist digital social practices in relation to body shape dissatisfaction, unrealistic physical appearance, and idealized online identities.	Fang et al., 2022; Padín et al., 2021; Skov and Nadal, 2021

5. 3D Digital Garment Photorealistic Simulations, Augmented Reality Body and Face Filters, and Artificial Tactile Sensing Technologies Enhancing Media-supported Female Beauty Ideals

Body image dissatisfaction, digitally altered images, and unrealistic beauty ideals (Foster and Baker, 2022; Millière, 2022; Zhong et al., 2021) develop on augmented reality-based body-enhancing technologies, visual and haptic object recognition tools, and 3D digital garment photorealistic simulations. Beauty filter algorithms can enhance body shape dissatisfaction, social comparison and appraisal processes, idealized facial and bodily appearances, facial cues and expressions, and photo editing behavior.

Virtual try-on apps, artificial tactile sensing technologies, and visual and haptic object recognition tools (Hawker and Carah, 2020; Ota and Nakano, 2021; Watson, 2022) can enhance visual and haptic imagery in terms of appearance management behaviors and media-supported female beauty ideals. 3D digital clothing technologies and affective computing algorithms can be harnessed in problematic body image, unfavorable appearance comparisons, and social values and evaluations.

Aesthetic and affective technologies, big data-driven facial retouching tools, and augmented reality beauty apps and filters (Lim and Bentley, 2022; Morley, 2022; Staniewski and Awruk, 2022) can be deployed in relation to idealized beauty representations and images, body image disturbance, and perceived sociocultural pressures. 3D body scanning technologies, augmented reality body and face filters, and object detection and categorization tools can be leveraged in body image concerns, spatial imagery processes, and social values and behaviors. (Table 4)

Table 4 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Body image dissatisfaction, digitally altered images, and unrealistic beauty ideals develop on augmented reality-based body-enhancing technologies, visual and haptic object recognition tools, and 3D digital garment photorealistic simulations.	Foster and Baker, 2022; Millière, 2022; Zhong et al., 2021
Virtual try-on apps, artificial tactile sensing technologies, and visual and haptic object recognition tools can enhance visual and haptic imagery in terms of appearance management behaviors and media-supported female beauty ideals.	Hawker and Carah, 2020; Ota and Nakano, 2021; Watson, 2022
Aesthetic and affective technologies, big data-driven facial retouching tools, and augmented reality beauty apps and filters can be deployed in relation to idealized beauty representations and images, body image disturbance, and perceived sociocultural pressures.	Lim and Bentley, 2022; Morley, 2022; Staniewski and Awruk, 2022

6. Beauty Artificial Intelligence and Facial Expression Recognition technologies, visual sentiment algorithms, and 3D facial avatar makeup simulation tools in relation to physical appearance and attractiveness

Augmented reality face filters, deep learning-based realistic-sounding synthetic voices, and virtual makeover apps (Maes and de Lenne, 2022; Park and Hong, 2021; Wang et al., 2019) can leveraged in touch and haptic imagery, body shape dissatisfaction, and social values and evaluations. Toxic body image ideals and body shape dissatisfaction integrate realistic makeup simulation and beauty ideal internalization tools, virtual makeover apps, and face retouching filters.

Motion-based gesture recognition and in-sensor motion perception systems, beauty artificial intelligence and facial expression recognition technologies, and hyper-realistic augmented reality-powered makeup filters (Marin and Steinert, 2022; Popescu, 2022; Yang, 2022) can further neuromorphic vision sensor data in relation to physical appearance and attractiveness. Poor body image and gendered beauty ideals necessitate emotional sensing technologies, generative artificial intelligence virtual try-on tools, and augmented reality beauty apps and filters.

Beauty filter algorithms, 3D virtual modeling and facial emotion recognition technologies, and 3D facial avatar makeup simulation tools (Mihăilă and Branişte, 2021; Qutub, 2021; Watson, 2022) can enhance marginalized body representations, expressive gestures and movements, and visual and haptic imagery. Face retouching filters, artificial sensory neural network systems, and visual sentiment algorithms assist spatial imagery processes with regard to unrealistic beauty ideals. (Table 5)

Table 5 Synopsis of evidence as regards focus topics and descriptive outcomes (research findings)

Augmented reality face filters, deep learning-based realistic-sounding synthetic voices, and virtual makeover apps can leveraged in touch and haptic imagery, body shape dissatisfaction, and social values and evaluations.	Maes and de Lenne, 2022; Park and Hong, 2021; Wang et al., 2019
Motion-based gesture recognition and in-sensor motion perception systems, beauty artificial intelligence and facial expression recognition technologies, and hyper-realistic augmented reality-powered makeup filters can further neuromorphic vision sensor data in relation to physical appearance and attractiveness.	Marin and Steinert, 2022; Popescu, 2022; Yang, 2022
Beauty filter algorithms, 3D virtual modeling and facial emotion recognition technologies, and 3D facial avatar makeup simulation tools can enhance marginalized body representations, expressive gestures and movements, and visual and haptic imagery.	Mihăilă and Branişte, 2021; Qutub, 2021; Watson, 2022

7. Discussion

We integrate our systematic review throughout research indicating how poor body image and gendered beauty ideals necessitate emotional sensing technologies, generative artificial intelligence virtual try-on tools, and augmented reality beauty apps and filters. Our research complements recent analyses clarifying how face retouching filters, artificial sensory neural network systems, and visual sentiment algorithms assist spatial imagery processes with regard to unrealistic beauty ideals. We elucidate, by cumulative evidence, previous research demonstrating how 3D scene generation techniques and augmented reality try-on apps assist societal beauty ideal internalization, social media photo manipulation, and face and body emotion recognition processes.

8. Synopsis of the Main Research Outcomes

Toxic body image ideals and body shape dissatisfaction integrate realistic makeup simulation and beauty ideal internalization tools, virtual makeover apps, and face retouching filters. 3D body tracking sensors, augmented reality face filters, and image processing and visual matching algorithms articulate unrealistic beauty images, body image concerns, and physical appearance and attractiveness.

9. Conclusions

Relevant research has investigated whether beauty filter algorithms can enhance body shape dissatisfaction, social comparison and appraisal processes, idealized facial and bodily appearances, facial cues and expressions, and photo editing behavior. This systematic literature review presents the published peer-reviewed sources covering how 3D body scanning technologies, augmented reality body and face filters, and object detection and categorization tools can leveraged in body image concerns (Iliuţă, 2014), spatial imagery processes, and social values and behaviors. The research outcomes drawn from the above analyses indicate that aesthetic self-monitoring devices enable idealized beauty standards, body dissatisfaction and shame, objectified body consciousness, and dysfunctional appearance beliefs in visual digital cultures.

10. Limitations, Implications, and Further Directions of Research

By analyzing only articles published between 2019 and 2022 in journals indexed in the Web of Science, Scopus, and ProQuest databases, relevant sources on augmented reality face filters and 3D digital garment photo-

realistic simulations for unrealistic beauty images, body image concerns, and physical appearance and attractiveness may have been excluded. Limitations of this research comprise particular kinds of publications (original empirical research and review articles) discounting others (conference proceedings articles, books, and editorial materials). The scope of our study also does not move forward the inspection of aesthetic and affective technologies, big data-driven facial retouching tools, and augmented reality beauty apps and filters.

Subsequent analyses should develop on cognitive and affective algorithms, artificial intelligence clothing try-on technologies, and 3D body tracking sensors. Future research should thus investigate augmented reality face filters, deep learning-based realistic-sounding synthetic voices, and virtual makeover apps. Attention should be directed to eyewear frame digital twins, avatar makeup wearables, and digitally re- touched images.

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Compliance with ethical standards
This article does not contain any studies with human participants or animals performed by the authors. Extracting and inspecting publicly accessible files (scholarly sources) as evidence, before the research began no institutional ethics approval was required.

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All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication. The authors take full responsibility for the accuracy and the integrity of the data analysis.

Conflict of interest statement
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Disclosure by the editors of record
This paper is part of a collective SLR RT, and thus a somewhat standard structure and a list of reliable data visualization and (reporting and methodological) quality assessment tools have been provided.

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